Rock Products

DEVOTED TO

Concrete and Manufactured Building Materials

Volume X. CHICAGO, ILL, SEPTEMBER 22, 1910. Number 3.

CAROLINA PORTLAND CEMENT COMPANY

We are the largest distributers of Portland Cement, Lime Plaster, Fire-brick and General Building Material in the Southern States, and have stocks of Standard Brands at all of the Atlantic and Gulf Seaports, and at our interior mills and warehouses, for prompt and economical distribution to all Southern territory. Write for our delivered prices anywhere. Also Southern agents for the "Dehydratine's" waterproofing material. "Universal," "Acme" and "Electroid" Brands Ready Roofing. Get our prices.

Charleston, S. C. Birmingham, Ala. Atlanta, Ga. New Orleans, La

DEXTER Portland Cement THE NEW STANDARD

Sold Agents SAMUEL K. PHILLIPS & CO. Philadelphia

SPECIAL FEATURES IN THIS NUMBER

UNION MINING COMPANY

Manufacturers of the Celebrated

MOUNT SAVAGE FIRE BRICK GOVERNMENT STANDARD

DEVOTE a special department to the manufacture of Brick particularly adapted both physically and chemically to

Lime Kiln and Cement Kiln Construction

Large stock carried. Prompt shipments made. Write for quotations on Standard and Special shapes, to

UNION MINING CO., Mount Savage, Md.

CAPACITY, 60,000 PER DAY. ESTABLISHED 1841.

Phoenix Portland Cement UNEXCELLED FOR ALL USES.

Manufactured by

PHOENIX PORTLAND CEMENT CO.

NAZARETH, PA.

Sole Selling Agent, WILLIAM G. HARTRANFT CEMENT CO. Real Estate Trust Building, PHILADELPHIA, PENNSYLVANIA.

Ottawa Silica Co.'s Washed White Flint Sand

Is used for sawing stone in more than a dozen states. Cuts more and lasts longer than any other sand on the market. Unexcelled for Roofing, Facing Cement Blocks, White Plaster, etc. Freight rates and prices on application.

OTTAWA SILICA CO., Ottawa, Ill.

FOR GRIFFIN TUBE AND BALL MILLS

CHICAGO BELTING CO.

PURE OAK TANNED LEATHER BELTING

Send for Our Illustrated Catalog

111 North Green St., CHICAGO

FOR DAMP PLACES

Branches: NEW YORK PHILADELPHIA NEW ORLEANS PORTLAND, OREGON

Uniformity ATLANTIC & GULF PORTLAND CEMENT CO. Fineness

SALES OFFICE BIRMINGHAM ALA

PORTLAND TRADE COOSA MARK CEMENT

KIRKPATRICK SAND & CEMENT CO. GENERAL SALES AGENTS

RAGLAND, ALA

Capacity, 3000 barrels daily

HARBISON-WALKER

The Standard of Quality

You **know** what the linings for your cement and lime kilns cost per thousand brick but **do** you know how much per **ton** output? **That** is the cost that is vital, that's why we are anxious you should know. Write us.

HARBISON - WALKER REFRACTORIES CO.

PITTSBURGH, - PENNA.

HIGHEST GRADE PORTLAND CEMENT MANUFACTURED

ALLENTOWN PORTLAND CEMENT COMPANY

CAPACITY 1,000,000 BARRELS YEARLY

A PERFECT RECORD FOR TEN YEARS

IN ALL KINDS OF CONCRETE WORK

Send for 72 page Illustrated Catalog No. 25.

MARQUETTE CEMENT MANUFACTURING CO.

Chicago Office Marquette Building.

General Office and Works, LaSalle, Ill.

The Ironton Portland Cement Co.

Manufacturers of the

Celebrated Limestone Brand of Portland Cement

Used by the Railroads in Kentucky, Ohio, West Virginia, and Virginia during the past five years.

Cement as finely ground as any on the market.

Guaranteed to pass all the standard specifications.

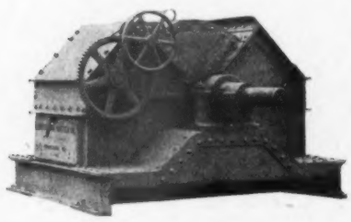
Plant located at Ironton, O., within easy access to seven States, namely, Ohio Indiana, Kentucky, West Virginia, Virginia, Tennessee and North Carolina.

Shipments via the N. & W. Ry., C. & O. Ry., C. H. & D. Ry., D. T. & I. Ry., or Ohio River. **Write for Prices**

The Ironton Portland Cement Co.

Ironton, Ohio

"PENNSYLVANIA" HAMMER CRUSHERS



For Pulverizing Limestone, Lime, Cement Rock, Marl, Shale, Etc.

Main frame of Steel; "Ball and Socket" Self-aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running.

No other Hammer Crusher has such a big Safety Factor.

PENNSYLVANIA CRUSHER CO.

Philadelphia

New York Pittsburgh

GRAVEL WASHING PLANTS

—Ask—

CHICAGO GRAVEL CO., - Chicago, Ill.
JOLIET S. & G. CO., - Plainfield, Ill.
PETERSON & WRIGHT, - Akron, Ohio
SOUTHERN G. & M. CO., Brook Haven, Miss.
About Their Plants

Stone Crushing Cement and Power Plants

J. C. Buckbee Company, Engineers, CHICAGO

"CHICAGO AA"

1,250,000 Barrels Annually

HIGHEST QUALITY
"THE BEST THAT CAN BE MADE"

"Chicago AA" Portland Cement is best adapted for use in making concrete because of its absolute uniformity, fineness, prompt hardening and attractive color. "Chicago AA" is **second to none**, and every barrel is fully guaranteed to meet the requirements of the Standard Specifications.

CHICAGO PORTLAND CEMENT CO.

108 La Salle St. Booklets on Request. Chicago, Ill.

"LEHIGH" PORTLAND CEMENT

High Tensile Strength, Finely Ground, Light and Uniform in Color. Manufactured by the

Lehigh Portland Cement Co.

ALLENTOWN, PA.

Western Office:
725 Rockefeller Building
CLEVELAND, OHIO

Write for Catalogue

Capacity, 8,000,000 Yearly

ONE GRADE—ONE BRAND

Alpha Portland Cement

Best in the World for Sidewalks

Write for our Handsomely Illustrated Book. Sent Free.

General Offices: No. 7 Centre Square, EASTON, PA.

——SALES OFFICES:——

The Oliver Bldg., PITTSBURGH.
Builders Exchange, BALTIMORE.
Marquette Building, CHICAGO.
Harrison Building, PHILADELPHIA.
Builders Exchange, BUFFALO
Board of Trade Bldg., BOSTON.
Hudson Terminal Bldg., N. Y.
Nat'l Bank Bldg., SAVANNAH, GA.

"THE BEST IS NONE TOO GOOD"

HIGHEST GRADE of Portland Cement

Every Barrel Absolutely Uniform.

R. R. facilities especially adapted for prompt shipments in the northwest.

Capacity 1,500,000 bbls. Yearly.

NORTHWESTERN STATES PORTLAND CEMENT COMPANY

MASON CITY, IOWA

TWENTY LONG YEARS

of time and weather tried out Ricketson famous "Red Brick" Brand.

They Never Fade

COLOR

for Mortor, Brick, Cement, Stone, etc., and proved it to be absolutely permanent. Red, Brown, Buff, Purple and Black.

Ricketson Mineral Paint Works

MILWAUKEE, WISCONSIN

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REPROD

Rock Products

DEVOTED TO

Concrete and Manufactured Building Materials

Volume X | CHICAGO, ILL., SEPTEMBER 22, 1910 | Number 3

THE MODEL CITY OF COREY, ALABAMA

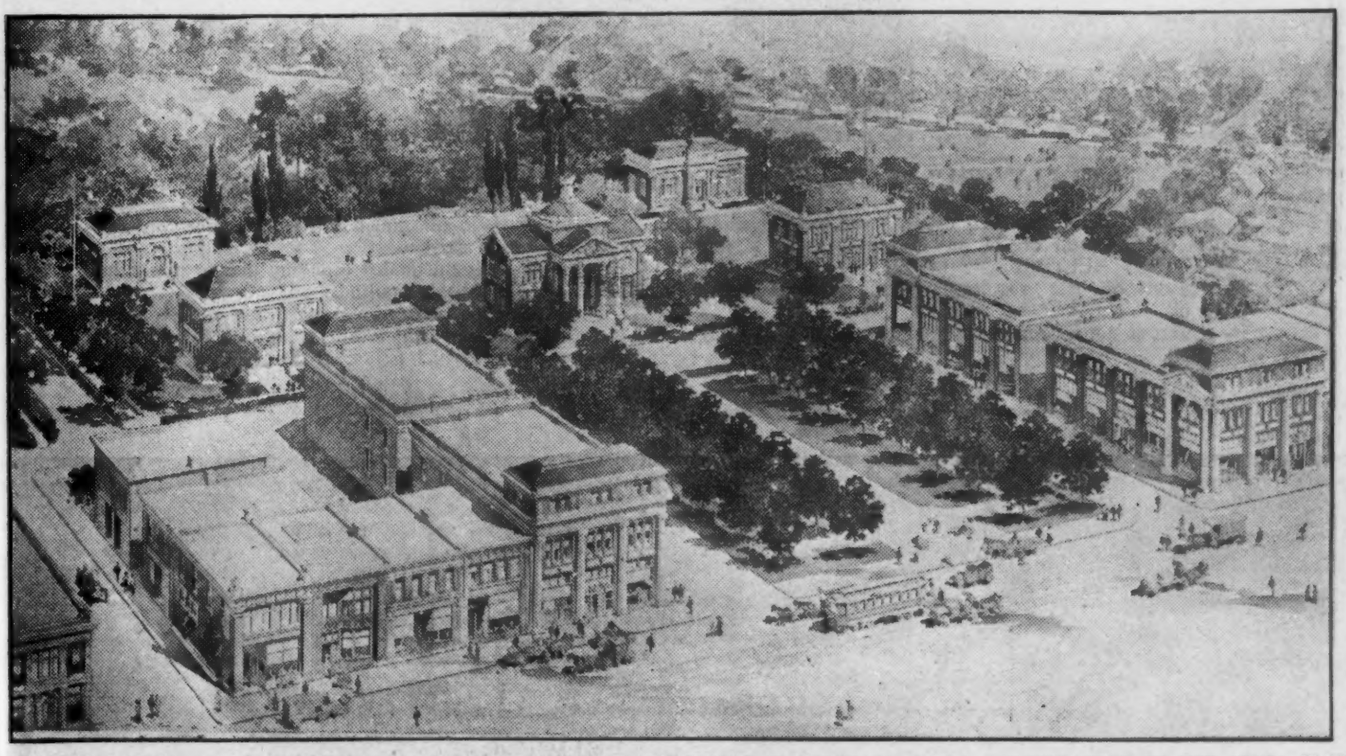
Near Birmingham, now being built, will rival Gary, Indiana, as an Important Manufacturing Center—Described by Ben. S. Gross.

Never, since the industrial awakening of the South, have the industry and energy of her developers been better demonstrated than by the building of "The Model City," Corey. This is a broad statement, but one that will bear the closest investigation, for indeed this twentieth century city of the workingman is being erected in record-breaking time, and what only a few weeks before was a cotton field and a gently rolling, well-shaded knoll will in the course of several months be a bustling, thriving city, pulsating with life and action.

The decision to build Corey had its inception when the United States Steel Corporation purchased about 2,600 acres of land in the vicinity of Birmingham for the purpose of building great plants and manufactories. After acquiring the land, the corporation immediately announced that the first great plants to be erected were those of two subsidiary companies, namely, the first unit of the finishing mill of the American Steel and Wire Company, covering 18 acres, costing $4,000,000 and to employ from 1,500 to 2,000 men, and the first unit of the By-Product Coke Ovens, of the Tennessee Coal, Iron and Railroad Company, 1,200 by 1,400 feet, costing $4,000,000, and to employ on its construction alone for a period of about two years from 1,000 to 1,500 men.

Corey was selected by the steel corporation to be

(Continued on Page 42.)



REPRODUCTION OF PLAZA AND PROPOSED CIVIC CENTER OF COREY. IN THE CENTER IS THE PLAZA, 150x210. AT THE HEAD OF THE PLAZA IS THE MUNICIPAL BUILDING; ON ONE SIDE THE Y. M. C. A. AND PUBLIC SCHOOL; ON THE OTHER THE PUBLIC LIBRARY AND PUBLIC BATH BUILDINGS. ON THE RIGHT SIDE OF THE SQUARE IS THE BANK OF COREY BUILDING WITH HOTEL ON SECOND AND THIRD FLOORS, AND ON THE LEFT SIDE IS THE OFFICE AND STORE BUILDINGS.

Power & Mining Machinery Co.

MILWAUKEE, WIS. U. S. A.

District Offices:

Chicago New York City Atlanta El Paso San Francisco

"Half the size, Half the weight; Half the height, Half the freight."	**TO WHICH MIGHT ALSO BE ADDED:**	*"Half the efficiency, Half the life; Half the success, Double the strife."*

All the above at the same price of a real crusher, too, such as the

"McCULLY CRUSHER"

McCULLY CRUSHERS ARE NOT SOLD BY RHYME BUT BY REASON

By reason of their unequaled capacity and wearing qualities on rock and ore of any degree of hardness, and WITHOUT MELTING ANY BABBITT.

By reason of not requiring pumps for circulating the oil.

By reason of not requiring any cooling system for cooling the oil.

By reason of their unequaled efficiency under any and all conditions of service.

By reason of their unequaled economy due to minimum power, oil and repairs required.

By reason of many other "reasons",—too numerous to mention here, but which are contained in our new Catalog No. 4-R which is just off the press.

DO YOU WANT IT? THEN SEND FOR IT. IT'S FREE!

Principal Products

ROCK CRUSHING MACHINERY MINING AND SMELTING MACHINERY

CEMENT-MAKING MACHINERY

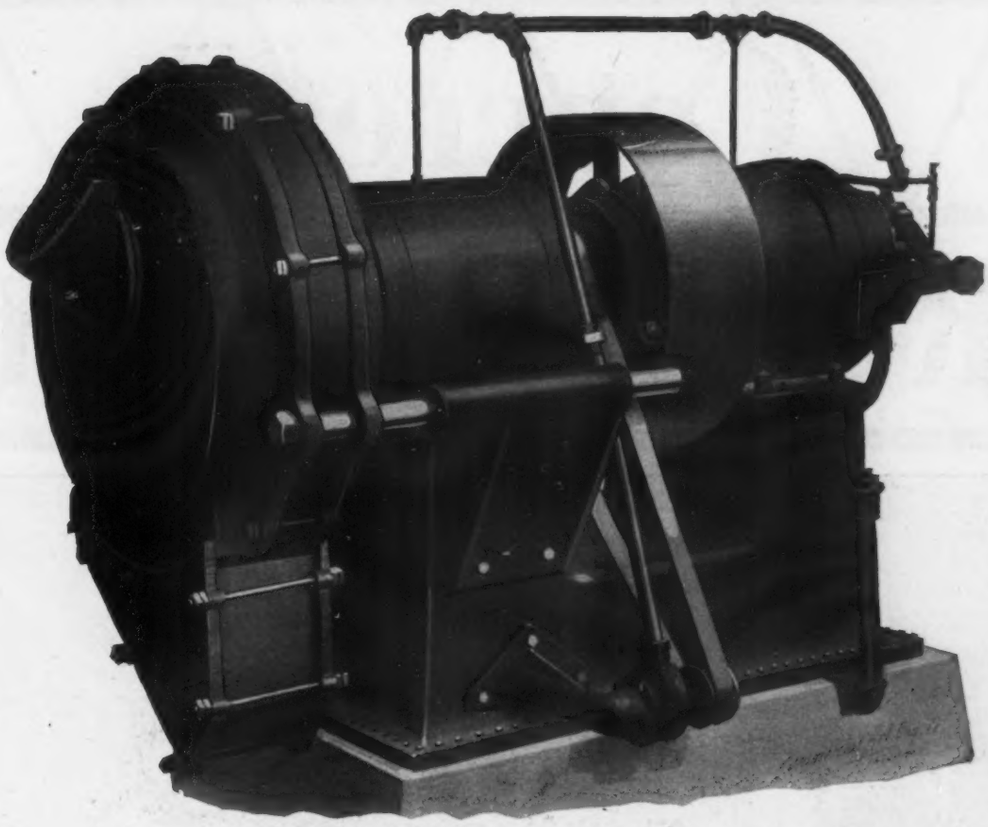
WOOD IMPREGNATING PLANTS POWER TRANSMITTING MACHINERY

LOOMIS-PETTIBONE GAS GENERATORS

SUCTION GAS PRODUCERS

Write for Catalogs on any of Above, Mentioning this Journal.

EVERY TIME!



The SYMONS DISC CRUSHER is an **"Easy Winner"** on the following points:

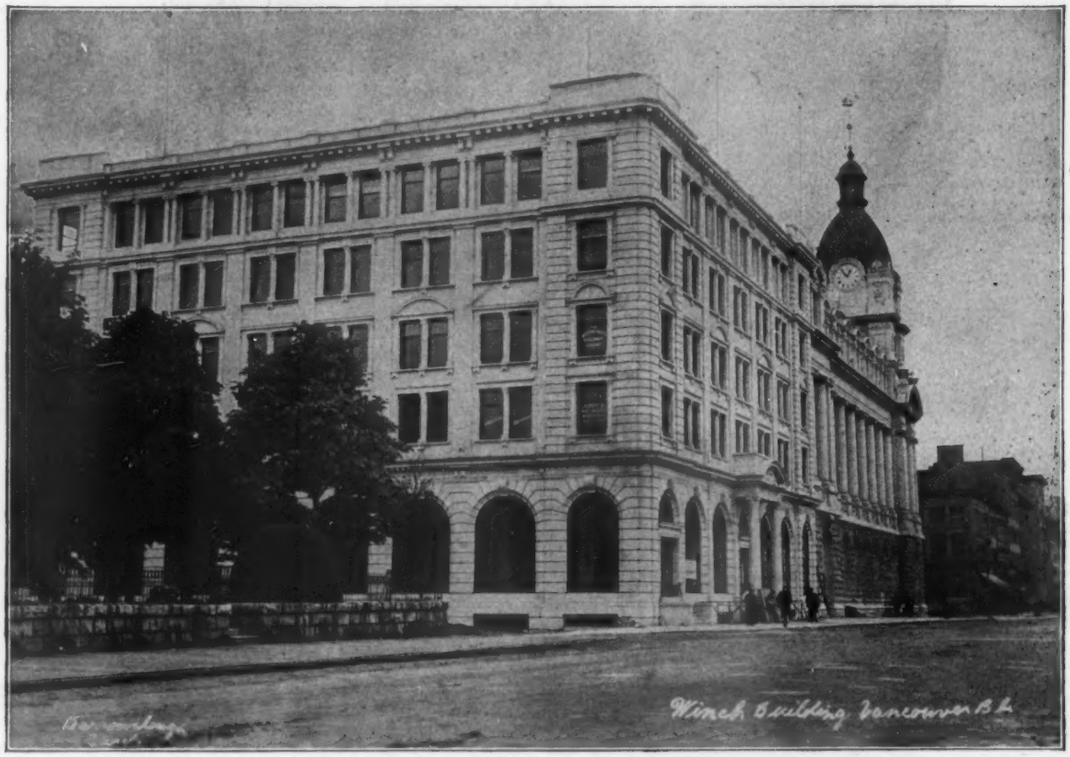
1. In making any size of product desired from 3 inch to 3-16 inch.
2. In the easy method of changing the size of product.
3. In great capacity.
4. In provision for taking up wear.
5. In durability and low repair cost.
6. In simplicity.
7. In operation on wet or sticky material without slippage or choking.
8. In easy regulation of the crushing stroke to suit any stone or ore.
9. **IN SATISFACTION TO THE CUSTOMER.**

The conclusive argument is made by the **machine itself.** We will send it to you on 20 days trial, allowing you to return the crusher to us, if for **ANY** reason you are not entirely satisfied.

Symons Brothers

605 Majestic Bldg. **MILWAUKEE, WIS.**

Triangle Mesh Concrete Reinforcement



Winch Building, Vancouver, B. C. Triangle Mesh reinforcement used.

Made by

American Steel & Wire Co.

CHICAGO, NEW YORK, DENVER, SAN FRANCISCO.

WRITE FOR ILLUSTRATED PAMPHLET

United States Steel Products Co., 30 Church St., New York., Export Representatives

CERESIT TRADE MARK
ECONOMY

WATERPROOF CONCRETE

CERESIT TRADE MARK
PERMANENCY

Ceresit means 16 years' experience in waterproofing research. Ceresit Paste is added to the water used in mixing mortar or concrete. With the water the Ceresit Paste penetrates to all parts of the concrete or mortar.

Ceresit is now being used for the Harper Memorial Library (Chicago University) which is more than an ordinary waterproofing job. There is a reason why Ceresit is so widely known all over the world. **Insist upon Ceresit being specified for your next building.**

ASK FOR OUR FREE BOOKLET, SPECIFICATION, ETC.

CERESIT WATERPROOFING COMPANY

1307 Flat Iron Building
NEW YORK, N. Y.

GENERAL OFFICES:
Commercial National Bank Building
CHICAGO, ILL.

1218 Chestnut Street
PHILADELPHIA, PA.

MR. ARCHITECT—
MR. CONTRACTOR—
MR. ENGINEER—

WHEN you want a coating for concrete that *will not destroy the desirable, distinctive texture of concrete*, will give perfect satisfaction, will not chip, flake nor peel off, but will become a part of the material itself and protect your stucco or concrete construction against the ravages of dampness as well as give it any tint you desire, apply BAY STATE Brick and Cement Coating.

We can give you the names of some of the largest mills, public and private buildings, as well as those of leading architects, who have used this coating with perfect satisfaction. It is much more durable than either lead or cold water paints and can be applied to a damp surface.

It will lessen the insurance rate because it has been endorsed as a Fire Retarder by the National Board of Fire Underwriters. Ask your dealer for it.

Address us for our color cards and descriptive matter No. 7.

WADSWORTH, HOWLAND & CO., Inc.

Paint and Varnish Makers and Lead Corroders

82-84 Washington Street, - BOSTON, MASS.

ARE YOU SATISFIED

with the appearance and wearing qualities of your cement house? Is it **uniform** in **color** and waterproof? Are your cement floors dusting?

SYMENTREX

will remedy all these faults and will still give the surface the appearance of cement finish. It is not a lead and oil paint, but a coating, of which Portland cement is the basis. Can be applied also to brick, stone, wood or plastered surfaces, for either exterior or interior decorative purposes. *Manufactured in colors.*

Full particulars sent on request.

George W. de Smet

Chamber of Commerce Building **CHICAGO, ILL.**
Phone Main 1065

Portland Cement **Waterproofing**

PERFECTLY SIMPLE

WATER PROOFING

SIMPLY PERFECT

Compound 7c per Pound, Your R. R. Station

A COPY OF THE REPORTS OF TESTS MADE FOR CRITICAL PURCHASERS WILL SAVE YOU TIME AND WORRY

A Mixing Machine Loaned Free of Charge with Quantities

McCORMICK WATERPROOF PORTLAND CEMENT CO.

ST. LOUIS — Bank of Commerce Bldg. — MISSOURI

HIGH GRADE REPRESENTATIVES WANTED

MONARCH HYDRATED LIME

Cheaper and Better than LUMP LIME

MONARCH HYDRATED LIME

Its value to you is greater because—
—It costs less to handle—
—It can be thoroughly soaked in 24 hours—
—No screening required—
—Carries more sand—
—Gauges with a third less plaster—
—Spreads further—
—Easier—
—Will not air slack—

You will be a MONARCH MAN if you once try MONARCH HYDRATED LIME.

Our prices satisfies. Write us.
"We ship sudden"

The National Lime & Stone Co.
CAREY, OHIO

MITCHELL LIME

Is Chemically Pure and Practically Free from Waste

The Strongest White Lime on the Market. Used and recommended by Sand-Lime Brick Manufacturers, Chemists, Soap and Glue Works, Plasterers and Masons.

Prices Cheerfully Submitted

Mitchell Lime Company
MITCHELL, :: :: :: INDIANA

A. & C. Stone & Lime Co.

General Office: **Indianapolis**

Crushed Stone and White Lime

Sales Office at each Plant

Greencastle, Ind. **Portland, Ind.**
Ridgeville, Ind.

Lime Kilns at Portland, Ind.—Crushers at all 3 Quarries
Write the Plant nearest your Work for Prices
CRUSHED STONE, all sizes, SCREENINGS CLEAN
Connections with 6 Railroads Modern Machinery and Screens

The Ohio and Western Lime Company

WORKS AT
Huntington, Indiana
Marion, O.
Gibsonburg, Ohio
Fostoria, Ohio
Sugar Ridge, Ohio
Tiffin, Ohio
Genoa, O.
Limestone, Ohio
Lime City, Ohio
Portage, Ohio
Luckey, Ohio
Bedford, Ind.

MANUFACTURERS OF AND WHOLESALE DEALERS IN

Ohio and Indiana White Finishing Lime, Ground Lime, Lump Lime, Fertilizer, Hydrate Lime, Cement, Plaster, Hair, Etc., Etc.

MAIN OFFICE: Huntington, Ind. Branch Offices: Marion, Ohio.

Capacity 8000 Barrels Per Day

WRITE US FOR PRICES

ON

TIGER BRAND WHITE ROCK FINISH and LUMP LIME

The Kelley Island Lime and Transport Company, CLEVELAND, OHIO

CROWN HYDRATE

HIGH CALCIUM HYDRATED LIME

The Most Perfect Hydrated Lime Made

Kritzer Vacuum Process

MARBLEHEAD LIME COMPANY

KANSAS CITY CHICAGO

GLENCOE LIME AND CEMENT CO.

MANUFACTURES LIME AND LIME-STONE FOR FLUXING

DEALERS IN Lime, Cement, Plaster, Hair, Etc.

915 Olive Street . . . . ST. LOUIS, MISSOURI

FOWLER & PAY

Brown Hydraulic Lime, Austin Hydraulic Cement, Jasper Wall Plaster, Brick, Stone

CEMENT WORKS: Austin, Minn.
PLASTER MILL: Ft. Dodge, Iowa
WAREHOUSE: Minnesota, Transfer

MANKATO, MINN.

In the Southeast

are advantageously located deposits of Cement Rock, Shales, Clays, Fine Kaolins, Sands, Marbles, Granites, Limestones and other Building Stones awaiting development. The Southeastern States are growing more rapidly than any other section, and unsurpassed opportunities are found in them. The Southern Railway, Mobile & Ohio Railroad, Georgia Southern & Florida Railway and Virginia & Southwestern Railway give shipping facilities to all portions of the country.

M. V. Richards, Land and Industrial Agent
1370 Pennsylvania Ave., Washington, D. C.

Tell 'em you saw it in ROCK PRODUCTS

Banner Hydrate Lime

HIGH MAGNESIA FINISHING LIME
Manufactured by the

National Mortar & Supply Company

Office at Pittsburg, Pa. **Works at Gibsonburg, Ohio**

Enlarged capacity

"IF IT IS **LIME** **WE MAKE IT"**

Lump - Barreled - Hydrated - Ground
STRONGEST IN OHIO.
We are not connected with any Trust or Combination.

WRITE US
PHONE US
The Scioto Lime and Stone Company, Delaware, Ohio

Farnam "Cheshire" Lime Co.

OF CHESHIRE, MASS.
MANUFACTURERS OF THE
Celebrated Cheshire "Finishing" Lime

Well known throughout New York and the Eastern States as the finest finishing lime manufactured. The special feature of this lime is its quick and even slacking, thus preventing any cracking or checking when put on the wall. It is the best lime used in the country today for all

HIGH GRADE FINISHING WORK

Selling Department, 39 Cortlandt St., N. Y., C. J. CURTIN, Pres't.

LIME

BASIC PRODUCTS CO. WET PROCESS BASIC HYDRATED LIME KENOVA, WEST VIRGINIA.

Rotary Kiln Process, burned with Natural Gas.

Our **"Wet Process"** hydrate scientifically slaked and cured in large vats, dried, milled and put up in Bates Valve Bags, 40 lbs. each. A perfect product.

The Best Yet Produced.

Lump Lime, car lots.
Dolomite, for Basic flux and furnace uses.

Mr. Lime Manufacturer:

¶Do you know that every lime plant that employs the BATES SYSTEM of bagging their lime is doing it at a LESS COST than you do if you do not employ that SYSTEM? IT'S A FACT.

¶Our lime, cement and plaster sacks are giving universal satisfaction. We GUARANTEE the quality.

The Urschel-Bates Valve Bag Co. TOLEDO, OHIO

Hydrated Lime

Bulletin No. 35

The many merits that Hydrated Lime possesses over common or lump lime are almost too numerous to mention. There is not an architect, mason, contractor, dealer, corporation or builder in all this broad land of ours, that is up-to-date, but acknowledges the **Superiority of Hydrated Lime. This now is an accepted fact.** It is being used universally and the Demand has correspondingly increased, and is increasing every day, to such immense proportions that it is incomprehensible that the right and Only Guaranteed Process is not adopted by all.

The Kritzer Way is the Right Way

The Kritzer Hydrating Process has Always been Successful. We have expert engineers, and practical men to design, build, and equip a complete Hydrating plant for you—**exactly suited to all conditions and needs of your locality.**

We absolutely Guarantee not only this but that we will build the best Hydrating Plant ever erected,—one that will

Produce the Best Results, Most Economically.

To continue year after year burning lime and selling it on a small margin of profit is a

Poor Business Policy

Architects and Owners, Masons and Contractors everywhere are demanding Hydrated Lime because of its proven and acknowledged superiority. The Dealers are anxious to handle it, not only because of the Better Profits that accrue to them but also owing to the many other great advantages that this commodity gives them.

Now is the time for You to Get Busy

For full particulars on the **"Only Guaranteed Successful Process,"** write

The Kritzer Company

115 Adams Street, - CHICAGO, ILLINOIS

Tell 'em you saw it in ROCK PRODUCTS

Below is given a letter received from C. W. S. Cobb President of the Glencoe Lime and Cement Co. of St. Louis, Mo. endorsing the Gas Producer Plant recently installed for his company.

Glencoe Lime and Cement Co.

St. Louis, May 2, 1910.

Mr. E. Schmatolla,
150 Nassau St.,
New York City.

My dear sir:

We confirm herewith that you left our new lime kiln and gas producer, which you designed and lighted for us in good working condition. The Producer gives plenty of gas on natural draft even with an inferior (slack) coal which we have to use in consequence of the miners' strike. Thus far the coal consumption and output under adverse conditions are satisfactory, and we are greatly pleased with the simple and easy manner in which the kiln can be worked.

After our men become more familiar with the system, and a few details are worked out, we expect still better results than you have promised. The quality of the lime made by this gas system is entirely satisfactory.

I am,
Yours very truly,
(Signed) C. W. S. COBB,
President.

ERNEST SCHMATOLLA
CONSULTING ENGINEER
150 Nassau Street, New York City
Branch Offices in London and Berlin

Specialist in designing, constructing and operating Gas Producers, Furnaces and Kilns for Rock Products, Chemical and Metallurgical purposes.

Longest experience and greatest success in PRODUCER GAS FIRED SHAFT KILNS for burning lime, dolomite and magnesite.

Many of these kilns, with daily outputs ranging from one to fifty tons per day, have been built in Germany, Austria, England, Russia and other European countries, also in America, Africa and Australia. Greatest economy in fuel and labor; very simple in operation, high class product, natural draft, all kinds of fuel, hard and soft coal, lignite, peat, wood and wood refuse. Best references.

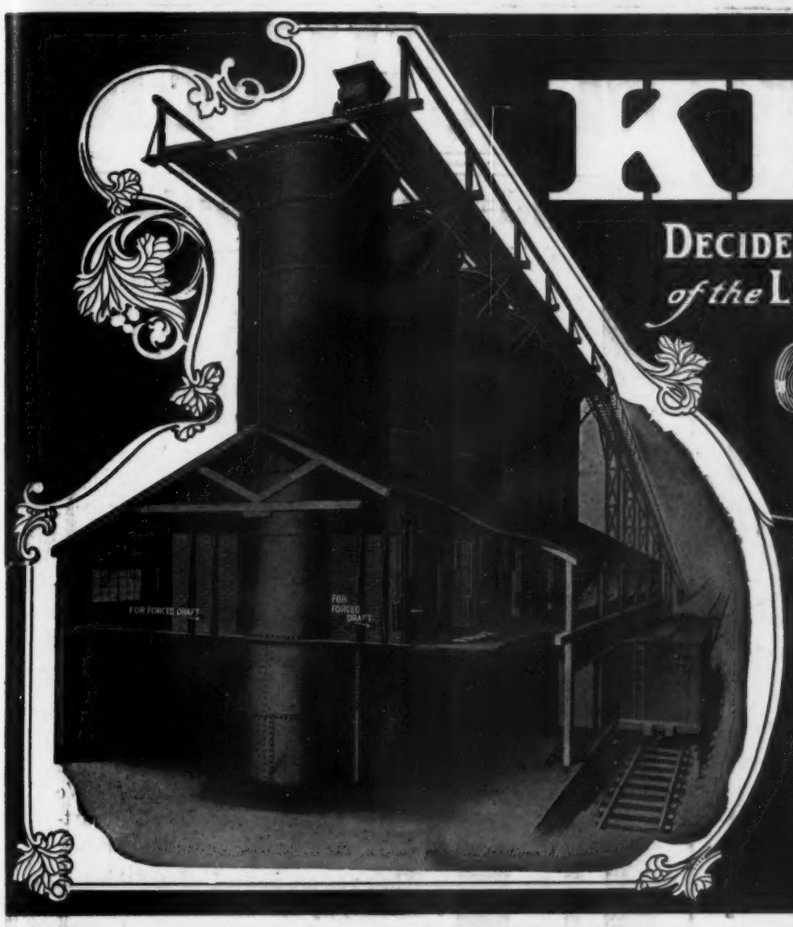
The Bradley Producer
Gas Process for Burning Lime.

Four and three-quarter pounds of lime to one pound of coal on a large output is now being secured every day.

Does that look like economy to you?

RESULTS GUARANTEED

Duff Patents Company Frick Building Pittsburg, Pa.



KILNS

DECIDE *the* EARNING CAPACITY *of the* LIME MANUFACTURING PLANT

THE KEYSTONE LIME KILNS
(Patented)
are famous money makers and express the highest type of modern developement. There's none quite so good, and the price is right.

FULL PARTICULARS
WILL BE CHEERFULLY FURNISHED

STEACY-SCHMIDT
MANUFACTURING CO.
YORK·PENNA

Limestone and Shale

FOR MANUFACTURE OF

Portland Cement

ON THE

Illinois Central Railroad

THE

WEST AND SOUTH

Coal, Water and Good Labor

For Full Particulars Address

J. C. CLAIR, Industrial Commissioner

I. C. R. R. CO.
No. 1 PARK ROW CHICAGO

Do You Have Cars to Haul?

The Davenport Locomotive Will Save Money

Special Designs for Special Purposes
Any Size, Any Gauge, Any Weight
Write for Prices and Particulars

DAVENPORT LOCOMOTIVE WORKS
DAVENPORT, IOWA

BRANCH OFFICES.
Chicago, 12 & 14 So. Canal St. Minneapolis, 107 3rd Ave. No.
Seattle, 1215 1st Ave. So.
F. H. Hopkins & Co., Montreal, Que., Canadian Representatives

Tell 'em you saw it in ROCK PRODUCTS

2,000,000 REVOLUTIONS A YEAR FOR THESE WHEELS

FEW buyers of dump wagons ever stop to consider the enormous amount of work done by the wheels in the course of a year. Two million revolutions of a wheel in a year is nothing unusual for a Troy dump wagon, and there are innumerable shocks and jars on the wheel for every turn it makes. This is why our first thought has been to make Troy wheels tougher and stronger than those on any other make of dump wagon.

Our next consideration has been to produce a dump wagon box of equal durability, and to accomplish this end, we found it necessary to make the bottom doors of steel—not of wood lined with a thin skin of iron that soon rusts and wears through.

Combined with the best wheels and the best dump box to be had, we give the best dumping mechanism. This last can be fully appreciated if you will send for and study our catalog No. 2 P.

The Troy Wagon Works Co.

101 East Race St., - TROY, OHIO

MACHINERY

—FOR—

Industrial Plants

We manufacture machinery for transmitting power, and for elevating and conveying materials in and about cement plants, rock crushing plants, lime plants, mortar works, plaster works, and other industries.

We manufacture screw conveyors, belt conveyors, and all sorts of chain and cable conveyors, for handling rock, lime, sand, etc.

We manufacture elevators, also, for handling the same kinds of material. Our lines include shafting, couplings, bearings, collars, pulleys, gears, rope sheaves, sprocket wheels, elevator buckets and bolts, steel elevator casings, etc.

We have our own foundry, sheet metal department and machine shop. We employ first-class help in all departments and use high-grade materials.

When you are in need of anything in our line, try us.

Catalog No. 34

H. W. Caldwell & Son Co.

17th St. and Western Ave., Chicago

Fulton Bldg., Hudson Terminal, No. 50 Church St.
NEW YORK CITY

Remember—

If it isn't a Nuttall, it isn't the best gear money can buy.

Nuttall—Pittsburg

When in a hurry, wire us.

GOOD ROADS CONSTRUCTION CO.

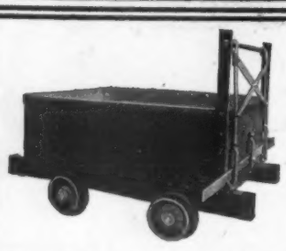
General Offices, Byrd Bldg., Memphis, Tenn.

Our Quarry Facilities are of the Best.

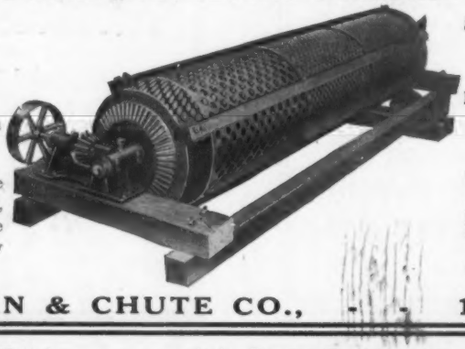
We build municipal street work, turnpikes and give attention to all construction work of a similar character. Our organization is backed by twenty-five years experience, and we are in a position to furnish specifications and estimates promptly. Individuals, Corporations or Municipal authorities are invited to correspond with us.

DO YOU NEED

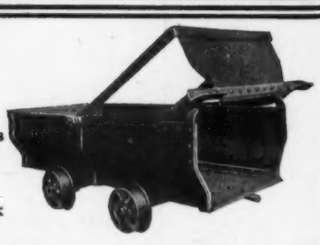
—CARS—REVOLVING SCREENS—



Elevators
Elevator Buckets



Stone Skips
Portable Track



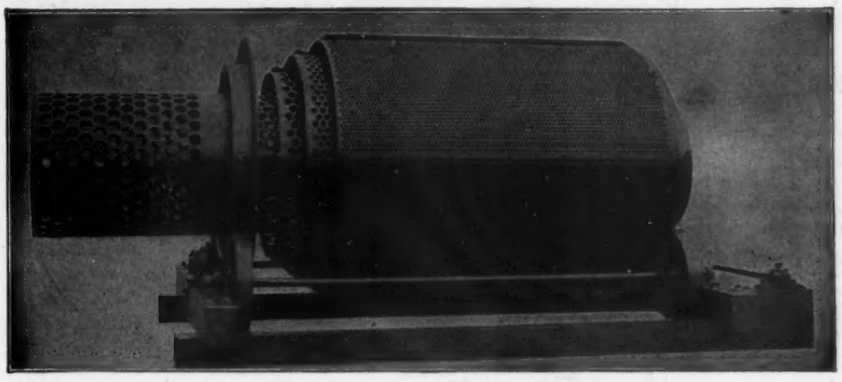
We manufacture a complete line of the above equipment. Also design and build special cars, buckets, hoppers. Send us your specifications—we will quote you promptly and believe we can show you we have what you want.

We have 5 new 1½ yard cars similar to the above in stock ady for immediate shipment. We will quote you price on these that should interest you. We also carry a stock of track, turntables, switches.

If interested send for Catalogue R-31, which illustrates kind and quality of equipment we make.

H. B. SACKETT SCREEN & CHUTE CO., - - 1679 Elston Ave., CHICAGO.

JOHN O'LAUGHLIN'S SCREEN



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on the market for wide-awake quarry-men and miners, who want to separate crushed granite, limestone or other minerals, gravel, sand, coal or coke. It will soon earn its cost in saving of repairs, and maintenance, and reduced power, and will do more and cleaner work than any other cylindrical screen of like area. No one can afford to keep old traps in use when the **O'Laughlin** installed

NOW

will from the moment it starts give a better and larger product, and a big interest on your investment in continuous saving in cost of repairs, renewals, and power. For particulars, address:

The advantages of these screens are described in detail in a circular which WE WILL MAIL TO ANY ADDRESS. Mr. John O'Laughlin, the inventor, has designed many notable improvements in rock-drilling, quarrying, crushing and screening machinery, and uses these improved screens in his own crushing plants, which others have declared "to be the most perfect in existence in every detail." The O'Laughlin Screen is an important factor in the most modern and perfect stone-crushing plant.

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Corner Francisco and Carroll Ave., Chicago, Ill.

Perforators of Sheet Metals, Flat, Cylindrical, and Conical Perforated Screen Plates for Quarries, Mines, Reduction Works, Mills and all Industrial Purposes.

Osborne Crushing Plant of the Springfield Coal & Ice Co.

We are prepared to ship crushed limestone from ⅞ to 3½ inches on short notice.

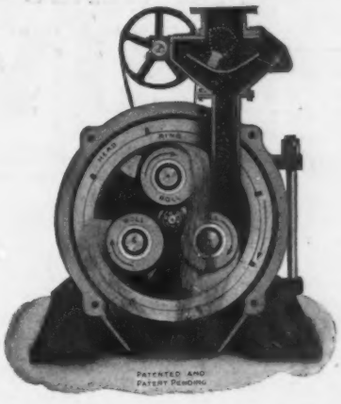
On account of the high percentage (96 to 98%) carbonate of calcium, this material is especially suited for fluxing.

Excellent Shipping Facilities and Prompt Service.

The Springfield Coal & Ice Co.

SPRINGFIELD, O.

Sturtevant Ring-Roll Pulverizer



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No Fans, Plows, Scrapers, Pushers, Shields or Screens, to wear out and take unnecessary power.

Only Four Wearing Parts — (Ring and 3 Rolls.)

Replacing these make an old mill new. These wear from 6 to 18 months

Submit your Crushing and Grinding problems to us — We make many kinds of **Crushers, Rolls, Pulverizers and Screens**

SEND FOR CATALOGUE

Sturtevant Mill Co., Boston, Mass.

Amatite ROOFING

TRADE B MARK

CITY LUMBER AND COAL CO., WATERBURY, CONN.
Covered with 15,000 square feet of Amatite.

They Figured Carefully and Chose Amatite

When a man is under the necessity of using a lot of roofing, he is pretty sure to study the subject with great care. That is why Amatite is so often used on the big ready roofing contracts. A man who has only a few hundred feet of roof will often be careless in his choice of roofing, but when it comes to thousands of square feet, (as above) Amatite is sure to be used.

The following is a typical instance:

Waterbury, Conn.,
Nov. 19th, 1909.

Barrett Manufacturing Company.

Dear Sirs:—We wish to inform you that the "Amatite" Roofing which we have used on our office, store house, lumber shed and barn has given most satisfactory service. The area that these roofs cover is about 15,000 square feet. The roofing is unusually attractive in appearance, and in our judgment it is the most durable and satisfactory made. The fact that it requires no painting appeals to us very strongly, and this feature makes it by far the cheapest ready roofing on the market.

Yours truly,
CITY LUMBER & COAL COMPANY.
[Signed] F. B. Boardman, Treasurer.

The economy of Amatite is not only in its durability and its price (lower than any other mineral surfaced ready roofing on the market), but also in the fact that *it requires no painting.*

You may be sure it would cost something to paint their big roofs if they used a roofing that needed painting. All that is saved with Amatite.

A sample of Amatite will be sent you for inspection, free, if you will send name to the nearest Barrett office at once.

BARRETT MANUFACTURING COMPANY

NEW YORK CHICAGO BOSTON PHILADELPHIA ST. LOUIS CLEVELAND CINCINNATI
MINNEAPOLIS PITTSBURG NEW ORLEANS KANSAS CITY LONDON, ENGLAND

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Use the World's Only Successful Substitute for Dynamite

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TWO PATENTS

For Crushed Stone and Silica Sand Quarries, Contractors, Stump Blasting, Ore and Slag Shooting, Clay and Shale, Oil and Gas Wells, Etc.

WATER GRADE

We are now making a grade of DYNALITE known as "WATER GRADE" for use in blast holes and other places where it is necessary to use explosives in water. This grade is RED. Ask for it if you have water to contend with. Break up cartridges in water and **take your time when loading, if you want to.** Will also stand more cold than any other High Explosive made and give better results.

Safer and Better Than Dynamite. Does Not Explode by Overheating. No Illness.

Manufactured by **The American Dynalite Co.**

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Magazines: Ottawa, Ill.; Akron, O.; Findlay, O., and others

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DYNAMITE

THE STANDARD EXPLOSIVE — ALWAYS FULL STRENGTH

ALWAYS THE SAME

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THE AETNA POWDER COMPANY

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Manufacturers of
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DIRECT HEAT
DRYERS
—FOR—
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COAL, ETC.
All Mineral, Animal and Vegetable Matter.

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American Process Company
68 William Street, NEW YORK CITY

RUGGLES - COLES
DRYERS
RUGGLES-COLES ENGINEERING CO.
NEW YORK CHICAGO

The Cummer Continuous Gypsum Calcining Process
See Other Advertisement, Page 63
THE F. D. CUMMER & SON CO.
Cleveland, Ohio
Seven plants in successful operation producing about 1,500 tons per day.

FOR IMMEDIATE SHIPMENT NEW AND REBUILT MACHINERY FOR CONTRACTORS AND QUARRY EQUIPMENT.
One Rebuilt New Era Elevating Grader "good as new." Rebuilt Jaw Crushers and Reversible Road Machines of Standard types. One 16 H. P. Farquhar Portable Engine. One No. 4 Champion Crusher and 15 yard Stone Bin. Complete Equipment and in first class condition.
HEADQUARTERS FOR Concrete Mixers, Wheelbarrows, Gasoline Engines, Gyratory and Jaw Crushers, Cars, Hoists and everything in Quarry Equipment.
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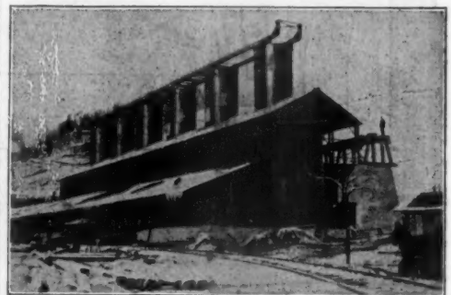
Excellent Results, Moderate in Cost and Expense of Operation
In sending for prices and printed matter describe your material fully, giving its percentage of moisture, required hourly capacity, etc.
S. E. Worrell
HANNIBAL, MO.



Lime Kilns and Plant of Blair Limestone Co. Canoe Creek, Pa.
Designed by
Henry S. Spackman Engineering Company
42 N. 16th Street Philadelphia, Pa.

C. K. WILLIAMS & CO.
EASTON, PA.
The Largest Manufacturers in the U. S.
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COLORING
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CORRESPONDENCE SOLICITED. SAMPLES AND ESTIMATES CHEERFULLY FURNISHED ON APPLICATION.

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The most secure fastening in concrete as well as in stone. Send for Samples.
H. Farrington, 45 Broadway, New York

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use our
CLASSIFIED SECTION

ROCK PRODUCTS

ESTABLISHED IN LOUISVILLE, KY., 1902.

DEVOTED TO CONCRETE AND MANUFACTURED BUILDING MATERIALS.

Volume X. **CHICAGO, SEPTEMBER 22, 1910.** **Number 3.**

Publication day, 22nd of each month.

THE FRANCIS PUBLISHING COMPANY

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EDITORS:

EDGAR H. DEFEBAUGH, FRED K. IRVINE.

ASSOCIATE EDITORS:

BENJ. F. LIPPOLD. HENRY C. WHITAKER. F. R. VAN HAMM

Communications on subjects of interest to any branch of the stone industry are solicited and will be paid for if available.

Every reader is invited to make the office of Rock Products his headquarters while in Chicago.

Editorial and advertising copy should reach this office at least five days preceding publication date.

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Subscriptions are payable in advance, and in default of written orders to the contrary, are continued at our option.

Advertising rates furnished on application.

Entered as second-class matter July 2, 1907, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879.

An organization among the sand and gravel men is shortly to be effected. Keep up the good work.

Building operations continue unabated in nearly all large centers and the fall and early winter promise brisk business for the builders' supply retailer.

Concrete railroad ties seem to be here at last, and several companies are preparing to manufacture them on a large scale. This is but the beginning of a very large industry.

The list of exhibitors at New York and Chicago Cement Shows constitutes an interesting record of the progress in the cement field. There are many new names and some of the old ones are missing.

The sand and gravel statistics published by the Department of the Interior, U. S. Geological Survey, sound a warning to the concrete operators which it is well to heed. There are cities in this country which do not appreciate the fact that sand and gravel, in order to be thoroughly efficient as an aggregate in concrete work, must be absolutely clean.

Lorado Taft, the famous Chicago sculptor, is busily engaged in the construction of a monumental concrete Indian to be forty-eight feet in height. This is the first large concrete monument ever erected in this country. Concrete being a very plastic material, offers a wide field for the sculptor who wishes to erect monuments of gigantic proportions which are impossible in stone, owing to transportation facilities.

The advantages of having a cement exhibition in New York are manifold. While concrete construction is recognized in a way, it has remained for the West to take the initiative in many instances. The East has always been more conservative in accepting new ideas and has been somewhat skeptical regarding the values of concrete in the past. The coming show should remove any remaining doubts.

Many experts are conducting experiments along the line of concrete roadways. In the meantime there are quite a number of municipalities which are satisfied with the progress that has been made thus far and are adopting them for their streets. Richmond, Ind., one of the first cities in this country to use concrete for streets, gives it its unequivocal endorsement. Mason City, Ia., showed its faith in the concrete street by putting down more of them this year. The concrete street is here to stay, and while improvements will probably be made, the experiments thus far have proven conclusively that they are a success.

The use of lime as a fertilizer is receiving consideration from the hands of the government and its various stations located throughout the country. However, the farmer has long since realized the benefits of lime and has been one of the steadiest customers of the producers. The government experts can, however, tell the reason why, and will do much toward strengthening the opinions already formed by crop experts.

The relative importance of various cities in the commercial world has been vastly changed since the issuing of the census reports. We extend our congratulations to those cities which have made substantial gains in their populations, because this means additional prosperity. This country is undergoing rapid changes every year, and the next decade may bring about just the opposite state of affairs, as the growth of cities is one of the strange pranks of fate which none can control.

There is much food for serious reflection in the cement statistics for the year 1909 as prepared by Ernest F. Burchard, for the Department of the Interior, U. S. Geological Survey, excerpts from which are printed in this issue. It all depends on the point of view from which you read these reports as to your conclusions, but there is one thing very apparent, that if the present ratio of plants being erected is kept up, the hope of the cement manufacturers to get a better price will be a forlorn one.

Exterior plaster treatment for modern residences is more and more the vogue. As the taste of the people generally becomes more elevated, such refinement gets to be a necessity. It is quite true that until recent years this important branch of the plastering art went by default, and such attempts as were made often ended in failure. Modern development in this line has made it quite out of order and even uncouth to think of building without using a considerable portion of the exposures as plastered surfaces.

The builders' supply retailers should have organizations in every state. If there is a class of dealers who should get together it is the retailers of builders' supplies, for there are very few commodities handled by them which fluctuate, to any extent, in price, and therefore it is best to have a uniform price in most localities. It is a noticeable fact that where organizations of this kind do exist, the retailers are making money, whereas, in other localities where price cutting prevails the retailers are always in a bad predicament.

The general complaint about slow collections would seem to indicate that somebody somewhere is the original hold-up man. One of the most prominent industrial financiers in this country recently said: "The world is too poor—too short of ready money this year to undertake any large new enterprise. There is not enough money to go around evenly on those things that have already been projected into the future for return and dividend. We must wait until there is a little time for more growth to even things up." So it is with us Americans, we capitalize the future, we spend money and charge it up to future generations, we always look for opportunities in the beyond. It is a bad habit that has been brought about by the fixed idea that our natural resources are boundless and inexhaustible. As a matter of fact, those same resources which in the days of our fathers seemed so immeasurable are today just about all taken up, and there is a very jealous owner for every stick and stone that has any value attached to it. New values and wealth can no longer be acquired by the right of original discovery, and very few collections will be made in future upon resources that cost the seller nothing—as has been the case in the past. It is just as much a part of healthy commerce to pay up promptly as it is to do a big volume of business.

EDITORIAL CHAT

A line from A. Baumberger announces that he has become the sales manager of the Eagle brand of Portland cement which is manufactured by the Cape Girardeau Portland Cement Company at Cape Girardeau, Mo. He is a member of the old crowd and has been attached to the Portland cement industry since the time it began to grow to its present importance as the primary building material of the country. "Baum" has always been connected with the best and the strongest concerns in the business and has never been guilty of selling any but good cement.

Charles H. Clairborn, of the Union Mining Co., Baltimore, Md., called to say hello to ROCK PRODUCTS the other day. He has just returned from the excursion of the Illuminating Gas Engineers of the state of Michigan. They held a convention on board one of the largest of the lake ships and took a cruise of a week through the Georgian Bay and the thirty thousand islands. It is a good place for holding a summer convention because the men who

EDWARD D. BOYER, OF THE ATLAS PORTLAND CEMENT COMPANY.

attend the conventions have no other things to distract them than the sea and the air and the sights along the shore. It guarantees a full attendance of the members at every meeting of every convention. Mr. Clairborn says that it was a very pleasant trip indeed and he doubtless had opportunity of talking to the gas engineers of the merits of the famous Mt. Savage checkers for water gas plants which he has sold all over the country and which is always as welcome as Charlie himself.

Frank Hunkins, of the Hunkins Willis Lime and Cement Company, St. Louis, was also here spending his vacation at Highland Park.

Edward D. Boyer, cement expert of the Atlas Portland Cement Company, addressed the convention of the Society of American Florists, at their meeting in Rochester, New York, on August 17, last, on the subject of "The Use of Cement, With Special Reference to Greenhouse Construction."

The South America steamship, carrying a complete outfit of structural tile machinery for Buenos Aires, Argentine Republic, was wrecked on the Island Lobos near Montevideo. Edward Pauly, a brother of the inventor, A. A. Pauly, and Herman Rauchfuss, expert tile makers, accompanied the shipment in order to set up the machines and to put them into operation, escaped with their lives but the ship and her entire cargo was a total loss. The Concrete Stone & Sand Company, of Youngstown, O., have been advised by cable that the Concrete Tile Company of Buenos Aires, will proceed to erect the buildings, etc., for their factory and a rush duplicate order for tile machines has been placed. As the building season in South America is about to begin they want to get the plant into operation before the first of the year.

J. M. Hamilton, for a number of years connected with the Rochester Lime Company, Rochester, N. Y., was a Chicago visitor recently. He is about to start a builders' supply company at Rochester to handle general jobbing, as well as retail trade, and has opened accounts with some of the principal manufacturers of building materials.

Mr. Hamilton is well equipped for handling this business, having had a number of years experience in connection with this line, and we anticipate that we will shortly be able to announce definitely his plans.

Edward M. Hagar, president of the Universal Portland Cement Company, and head of the popular cement exhibition movement, has returned from an extended European tour. He has made an expert inspection of cement conditions across the waters, and incidentally accumulated a pleasant vacation for himself in the doing of it.

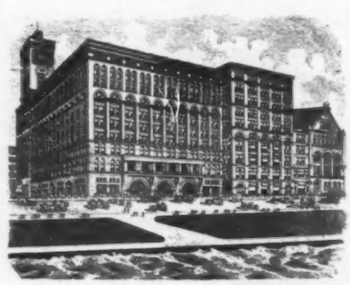
Francis M. Barton, architect and eminent cement specialist, of Chicago, announces that the plans for the "Gift House" which was won by Miss Williamson at the last cement show held in Chicago have now been completed. Miss Williamson has approved of the plans in every detail and the Cement Products Exhibition Company are proceeding with the construction of the house, which, according to the drawings, which the writer has seen, will be an artistic gem as well as a practical demonstration of the economy and good taste which can be secured only by building homes entirely of concrete. As such a demonstration, this house will be of immense value to the industry as well as an object lesson for all mankind in all future time as the crowning achievement of the cement development of this progressive age.

Manager J. P. Beck, of the Cement Products Exhibition Company, announces that the spaces for exhibits at both the New York and Chicago cement shows have been more liberally subscribed for than on any previous occasion and that the exhibitors indicate by their communications to him that the exhibits this year will be more elaborate, more educational and more directed to the principle of business-getting than on any previous similar occasion. In short, all the experience of past exhibitions has developed better intelligence of how to give a cement show, and those which are to come this season will be in all probability superior to their predecessors, for several reasons. Mr. Beck is now in New York on Exhibition business.

John G. Evans, of the Atlas Portland Cement Company, had a brand-new story the other day, and that winning smile of his that won't come off, which is an indication that he had a pocketful of orders, for it is noticeable that when John is busiest he is accumulating a better droll story to tell, which are always enjoyed by friends and customers alike.

Ernst Wiener, of the Ernst Wiener Company, 50 Church Street, New York City, returned early in the month from a business trip to Europe, where he has been spending several months.

E. L. Benedict, president of the Oklahoma Cement Brick and Products Company, Oklahoma City, Okla., was in Chicago this month.



AUDITORIUM HOTEL, CHICAGO, ILL.

A HOTEL HOME.

The business world, that is, those of us who have to spend half of our time away from home, are always interested in the management of the big hotels where we spend a great deal of our time.

For about eighteen years the writer has been in the Auditorium Hotel in Chicago on an average of two days a month, and sometimes as many as ten, to attend various meetings. It has always been a pleasure to visit this hotel, because there was always one face in particular that made life more pleasant. It was that of Will Shafer. For twelve years he has been manager, with the exception of the past year, when T. J. Talty, of Washington, was given charge, and through his superintendency and the co-operation of Mr. Shafer the hotel was practically made over. While always a good place to go to, it is even more cosy and comfortable today than ever.

A few weeks ago Will Shafer was reinstated as general manager of the hotel, and while all had a pleasant parting word for T. J. Talty, who was made assistant manager of the Congress Hotel, all of Mr. Shafer's friends were gratified to see him continue at the head of the institution for which he has done so much.

When you feel at home when you drop into a hotel there must be some reason for it and someone responsible for that comfortable feeling. Will Shafer has been the principal man in this respect at the Auditorium Hotel. We are glad he will continue at the old place.

WILLIAM SHAFER, MANAGER AUDITORIUM HOTEL, CHICAGO.

If you happen to be one of the people who do not know him, just call for him when stopping at the hotel; you will be acquainted the minute you shake hands. The same clerks will be on the firing line as ever, John J. Calvey and Geo. Avies, who are always glad and willing to be of any possible service.

L. V. Thayer, president of the Peerless Brick Machine Company, of Minneapolis, Minn., has been more or less of an invalid during the past summer and is taking an extensive business trip through the Southwest to Old and New Mexico and will incidentally take in the Oklahoma Cement Users' convention while en route. Mr. Thayer is in good spirits and looks forward to the full enjoyment of his trip to the southland and announces that he will be on deck about the time of the cement show season with his wonderful little Peerless machine, which is always to the fore.

F. C. Bailey, the popular salesman of the Atlas Portland Cement Co., has just returned from his vacation at a summer resort in Wisconsin. Bailey's face is "peeling off," and he certainly looks the part. But he is hot on the trail for Atlas just the same.

FOR THE RETAILER

The National Builders' Supply Association

Meets Annually.

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Henry W. Classen, Baltimore ..... Treasurer
James W. Wardrop, Pittsburg ..... Secretary

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Minnesota ..... John Wharry, St. Paul
New Jersey ..... J. M. Campbell, Passaic
New York ..... Henry Schafer, Jr., Buffalo
Ohio ..... J. P. Carlile, Columbus
Pennsylvania ..... John Strouss, Pittsburg
Rhode Island ..... C. M. Kelly, Providence
South Carolina ..... A. G. Grower, Greenville
Tennessee ..... W. W. Fischer, Memphis
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Charles Warner, Chairman; Frank S. Wright, Chicago, Ill.; Henry A. Moore, Philadelphia, Pa.; Ambrose Tomkins, Newark, N. J.; Edw. S. Walton, Youngstown, Ohio; Gordon Willis, St. Louis, Mo.; A. E. Bradshaw, Indianapolis, Ind.; Walter F. Jahncke, New Orleans, La.; V. H. Kriegshaber, Atlanta, Ga.

Official Organ, ROCK PRODUCTS

PHILADELPHIA RETAILERS' OUTING.

Philadelphia, Pa., Sept. 15.—The twelfth annual base ball game between the members of the Builders' Exchange and members of the Lumbermen's Exchange was played at the Pennsylvania Railroad Y. M. C. A. grounds Wednesday afternoon, Sept. 7th.

The proceeds of the game were given to the following institutions to aid the "Little Ones": Children's Country Week Association, Red Bank Sanitarium, Philadelphia Modified Milk Association, and Evening Telegraph Free Ice Fund.

Line-up of the game:

Lumbermen's Exchange—	Builders' Exchange—
Kugler, 3b.	T. Mulvaney, cf.
Robinson, ss.	F. Mulvaney, ss-p.
Hudson, 1b.	McCarron, 2b.
Hanna, 2b.	Byrne, 3b.
Hyde, cf.	Willis, lf-ss.
Malone, rf.	Ensinger, lf.
Gibson, c.	Dougherty, 1b.
Snell, lf.	Pomeroy, rf.
Wright, p.	Somers, c.
	Elliott, p.
	Hall, p.

Umpires—Harry Adams and Thomas Keenan.
Score—Lumbermen, 16; Builders, 12.

Builders: John Atkinson, Frank Reeves, Thos. F. Armstrong, Wm. R. Dougherty, F. M. Harris, Jr., committee; Chas. Elmer Smith, Sec. of Exchange; Benj. K. Nusbaum, mgr. of team; Wm. H. Painter, Jr., ROCK PRODUCTS. Builders' rooters: Wm. H. Barrett, Wm. A. Cramer, Chas. A. Ehrenzeller, W. D. Techt, A. S. Davis, John S. Mechem, W. R. Dougherty, Harry Anders, Wm. T. Boyd, J. B. Hoover, Alb. Zelfelter. Among some of those who attended the game were: Lumbermen, Franklin A. Smith, Jr., Wm. C. McBride, Chas. P. Maule, Chas. H. Laub, committee; Geo. Howes, mgr. of team. Lumbermen's rooters: Herbert P. Robinson, W. Henry Smedley, S. B. Vrooman, Wm. J. Collins, Chas. H. Wisler, Jos. P. Dunwoodie, Frank Buek, J. E. Smith, Jas. A. Richardson, Thos. B. Hoffman, Thos. E. Coles, Geo. Rodgman, R. B. Raynor, J. P. Comegys, H. A. Russell, H. H. Benners, A. S. McGaughan, Edwin B. Malone, A. J. Cadwalader.

The Jamestown Builders Supply Company, Jamestown, N. Y., has been organized to deal in building materials, etc. Capital stock, $10,000. The incorporators are Charles Swanson, Clyde T. Curtiss and Fred C. Olsen, all of Jamestown.

SUBSTANTIAL WAREHOUSES AND BARNS NEEDED.

Very often in these pages we have called attention to the matter of erecting warehouses for building materials out of incombustible materials. It is a well known fact that the dealers in builders' supplies almost invariably erect their own warehouses out of lumber. Worse than that, there is a very large percentage of the buildings used for the warehousing of lime, cement, plaster and the whole line of building specialties that are little more than patched up shacks which can scarcely be expected to turn the weather.

As a rule the supply dealer for this very reason has to pay the maximum rate of insurance upon both his buildings and their contents. It is all very well to say that the investment in buildings is a negligible quantity, and that they are empty for a part of the time at least. But the fact remains that the builders' supply business is in large part made up of receiving and storing large quantities of staple commodities and holding them in readiness for prompt delivery. A great deal of the goods so handled is sold upon a narrow margin of profit on terms that practically amount to a cash basis, and all of them are bought for cash. Not to carry insurance upon this kind of an investment is sheer folly, and the warehouse building has a great deal more to do with determining the rate of insurance premium than anything else.

It is quite exceptional to find a substantial building, but there are a few such warehouses in the supply trade as reflect favorably upon the sound business judgment of the management. And in every such case it is to be noticed that the banks and commercial agencies rate those houses in very high figures, with clusters of stars, and all of these things go a long way toward making the buying end of that establishment find opportunities that never get mentioned to the concern that is not prepared to properly take care of perishable goods at somewhere near the minimum of risk and cost. As we have often said before, it is good money in any dealer's pocket to provide a substantial weather proof warehouse, and it is all the better to have it fireproof as well at the same time.

There is some gratifying improvement in this line, as our readers have doubtless noted from time to time in the feature articles of modernized storage plants built of concrete in various places, and there will be more of this kind of warehouses as fast as the progressive members get around to their next investment in storage capacity.

No division of the well regulated supply business is more important than the teaming feature. A very considerable portion of the investment takes the shape of horse flesh, and it will always be so. The automobile truck for deliveries is economical within certain limitations and under a certain group of conditions. But the automobile with all its popularity has not succeeded in reducing the price of horse flesh so that anybody can notice it, and the fact remains that the horse will always be the main dependence as motive power for the delivery of building materials.

Good teams and steady teamsters are pretty sure business getters, for this is the key of prompt deliveries, which is only next in importance to having a full line of goods in stock. Consequently one stable at least is indispensable to every completely equipped establishment, and it must never be overlooked by the financial master of the concern that the value of horses depends very largely upon just how they are stabled, and the efficiency of teams depends quite as much upon the stable conditions as it does upon the feed and proper handling of the animal.

Ramshackle barns, with draughty stalls, and wet or mouldy floors are very expensive adjuncts to any organization that has to rely for its income upon the integrity of its horse flesh. The writers' very wide observation and experience leads him to consider that it is impossible to build a stable too well. As a matter of fact all horses are sensitive and delicate, and it takes very little to put them out of commission.

Most of the diseases of horses start right in the stall, many of them from germs that spring from the eggs of insects brought in from the fields in the hay, and in the straw that is used for bedding—mostly in connection with weeds tangled in with these. The seed or pollen from poisonous weeds often finds favorable lodgment in crevices of loosely constructed wooden lofts and germinate into vegetable or insect life that makes the kind of trouble that costs horses, efficiency and veterinary bills.

One stall out of thirty in a barn of the kind mentioned developed in the writer's experience, the reputation of making every horse sick with influenza that was put into it for even a single day. Twenty-nine more stalls in the same barn were perfectly safe.

There were genuine "stable niggers" in Kentucky in those days and that stall was duly declared "haunted." Of course there was just one way to treat a haunted stall according to Senegambian practice, and this is the way those negroes tackled the problem.

A spotted skunk was killed and skinned and the tail cut off from the pelt "arfter dahrk." A little goat's milk in a green goard was secured late in the afternoon. All the negroes were very solemn and sober about the hoo-doo incantation which began at night fall and lasted until the moon reached exact meridian. Then in silence the oldest negro took up the skunk's tail and gourd of goat's milk and smeared all about that "haunted" stall. Soon after it was duly announced that the hoo-doo must be at work by this time, and whatever had been the matter with that stall was "sure tuck out now."

But the next horse got the influenza all the same.

The old negro who used the skunk's appendix for a paint brush as described above, dug it up (for it had been religiously buried before sun up)

E. S. WALTON'S BARN, YOUNGSTOWN, O.

and declared that he was hoo-dooed to a nanny goat because the flesh was still fast to the bone, and this also fully explained why the hoo-doo had not worked in this particular case.

A few days later the boss arrived at that barn in company with an English veterinary who had seen service in India and Turkey. The Englishman had a case of instruments among which was a microscope. After examining the afflicted horses and taking care of them, he set about the examination of that stall, with the result that he found a great nest of ants in the dead bark upon a timber to which the feed box of that stall was fastened.

Those ants, more or less covered with fine dust from the dry, rotten bark, would swarm into the feed box and get mixed amongst the oats and corn, and when the horse would snort and dip into the feed he took up the initial germ that quickly developed into the disease as stated.

Those same negroes worked the familiar vermicide called whitewash in liberal doses for a day or two and that stall ceased being haunted at once. Incidentally there are several barns to our knowledge where a little whitewash would not go amiss.

Of course everybody has noticed the insurance rate on barns and on horses and vehicles contained in barns, no one could help noticing that, especially when with pen in hand one begins to draw the check for the premium. If ever there was or ever will be a place where incombustible building materials can be applied without danger of overdoing the idea, it is in barn construction, and no matter how much it costs, it is still cheap.

Perhaps no perfect design for a concrete barn has yet been developed from the strictly fire resisting standpoint, but there has been some progress in this direction, and it is sure to come in due time like everything else that is badly needed. Concrete is vermin-proof, and that is the next thing to fire proof when it comes to barn construction.

The Youngstown Ice Co., leading builders' supply dealers of Youngstown, Ohio, have just completed a splendidly designed concrete barn, as shown in our illustration. It measures 40 x 142 feet on the ground, and contains forty-two 6-foot stalls, two box stalls, one soaking stall and an office room 12 x 14 feet. It is built of the celebrated Pauly concrete structural tile, the hollow chambers of the tiles being filled with concrete to make them solid for the first ten courses above the ground. Hay racks, troughs, windows for light and ventilation, electric light, and every useful appointment has been provided.

Ed. S. Walton says it is a long ways the best barn he ever saw from every possible standpoint, and everything considered it is the most economical barn his company ever owned. Now that is going some, and it is a suggestion to many other dealers who have a valuable string of horses that need to be comfortably stabled the coming winter.

DENVER BUILDING NOTES.

All records of August building have been smashed this year. More money has been invested this month than in any August past. The total expenditure for this purpose was $724,055, against the next best of any previous year, being $700,595.

Owing to the failure of the A. & S. Wilson Company, of New York, which had the contract for the erection of the Central National Bank Building, the contract has been turned over to the Whitney-Steen Company, which will continue the work on the same plan and terms as the original contractors and complete it if possible by January 1, the time stipulated.

The Wilson firm went into the hands of receivers because it had many large contracts under way upon which it was unable to realize promptly, causing it to default on certain payments. The firm is not insolvent, it is said, and will later resume operations.

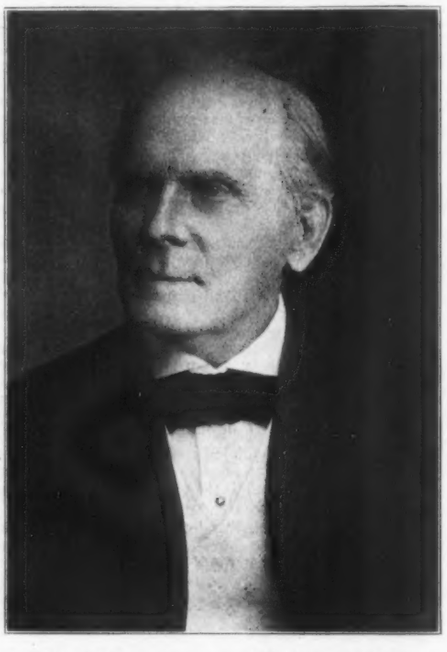
The Central National Bank Building is to be nine stories in height and will cost $400,000.00, exclusive of interior finish. The structure is of steel and concrete.

The Whitney-Steen Company are also contractors for the A. C. Foster Building, which is to be twelve stories. Other contracts are the Daniels & Fisher Stores Company Building and the Denver City Tramway Building and Car Barns, both considered to be examples of the most difficult engineering work of any of the new buildings.

Among the new buildings nearing completion are the First National Bank Building, twelve stories, by Jas. Stewart & Co., and the Gas and Electric Building, also twelve stories, by the Chas. G. Sheeley Contracting Company.

A PIONEER SPRINGFIELD RETAILER.

The firm of Aslag Eielson, Springfield, Ill., is one of the pioneer building material concerns in Central Illinois, having been established in 1868, and conducted continuously since in the same location. With the scope of business and sales constantly increasing it is one of the leading supply houses in this section. Aslag Eielson gained his insight to the lumber business, which gradually lead to the broader field of building materials, from the lumber industries along the great lakes when a young man. He was born in Norway, and after attaining a common school education he clerked for two years in a store. He then went to sea and sailed between Arendal, Norway, and Isle of Man for two years.



ASLAG EIELSON, SPRINGFIELD, ILL., PROMINENT RETAILER OF BUILDERS' SUPPLIES.

In 1852 he arrived in New York City, going from there to Michigan where he worked in the great pine forests bordering the great lakes. In 1867 he and others formed a partnership in the retail lumber business in Springfield, Ill.; in 1868 he bought his partners out and removed to his present location at Monroe and Tenth streets, where he has been engaged in business ever since. A. Eielson retired from active business in 1898, since which time his business has been conducted by his two sons, John and Oscar A. Eielson, and his grandson, Eilert Eielson. The yard which is located on the Wabash Railroad is well housed and has a good storage capacity, the firm having room for a stock of 300 barrels of lime and the same quantity of cement. While many brands are handled, the firm, catering to a large number of customers, do not confine themselves to any particular brand of lime or cement. Among the leaders, however, are the Chicago AA Cement of the Chicago Portland Cement Company, and the Atlas Portland Cement Company's brand.

SPRINGFIELD RETAILERS.

Springfield, Ill., Sept. 21.—Optimistic reports are received from all Springfield dealers in building materials. Those who are not inclined to rate the trade above the average fall condition concede that it is at least up to normal. Financial stringency in the central section is relieved by settlement of the Illinois mining strike and the resumption of this influential industry.

"Our trade is about up to the average," said Fred Partridge, of the Peter Vredenburgh Lumber Company. "Sales from the stock have been gratifying."

H. C. Irwin, of the firm of the same name bears out the assertion that the farmer today is using more cement and lime than in past years and this is helping out an otherwise good fall trade.

"Extraordinarily good," was the terse summary of Frank R. Miller, president and general manager of the Miller-Ansell Company. Supplemented by a steady demand upon warehouse supplies, the firm is supplying the material for the Seventeenth street paving, the new shaft of the Capital Coal Company, the United Zinc and Chemical Company's plant and the new First Christian Church.

Decided improvement in the concrete business and the allied retail trade is the verdict of E. W. Hocker & Co. The number of small jobs done for the average property holder is a considerable factor in the whole output. This firm reports a big business in concrete foundations for frame dwellings.

Oscar Eielson, of Aslag Eielson, vouches for a healthy resumption of trade after a lull brought on by idle Illinois mines and other causes. The yard trade of the firm is more than normal.

J. H. Schuck & Son are inclined to substantiate the opinion that a better than usual business is in sight, giving as a reason the additions to the natural course of autumnal orders.

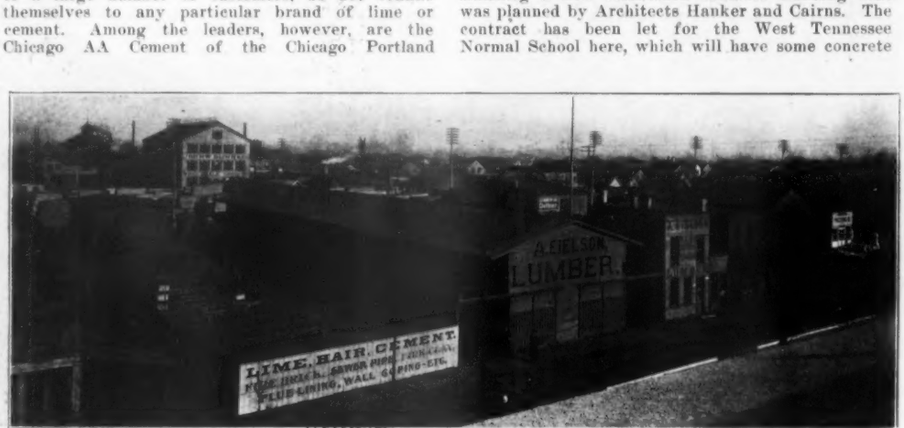
Nathaniel Gandy, of this city, is one of the active promoters who says a 100 room hotel at Second and Capitol avenue is assured. The structure, it is declared, will cost $150,000.00.

August building permits for Peoria aggregated $419,040.00. Among the most prominent of the buildings are: Orpheum theater, by the Leisys, $100,000.00; Larkin Company, warehouse, $150,000.00; Clarke distillery, new bottling house, $15,000.00.

Improvements now under way in Mattoon are estimated at $322,000.00.

RETAILERS IN MEMPHIS AND THE SOUTHWEST.

Memphis, Tenn., Sept. 17.—Autumn opens well in the Bluff City. Most of the supply firms and contractors are busy. Some large structures are to go up and many smaller ones. The Exchange skyscraper and the Central Bank & Trust Co. are practically completed and two tall office and loft buildings are in prospect. The bayou on the site of the new Union Depot is being done over in concrete. W. A. Bickford & Co. are preparing to remodel the old time Overton Hotel of war days, until recently, the court house here, for a new hotel and store building. Otto Schwill & Co. are finishing a new reinforced concrete building that was planned by Architects Hanker and Cairns. The contract has been let for the West Tennessee Normal School here, which will have some concrete



A. EIELSON'S OFFICE AND BUILDERS' SUPPLY WAREHOUSE, SPRINGFIELD, ILL.

floors. Architects Weathers & Ely Co. have drawn plans for several court houses and schools through Arkansas and Mississippi.

The Good Roads Construction Company headed by W. B. Troy in the Byrd Building, has a number of nice contracts through the Southwest on road work this fall.

The cement market is reported at Memphis about the same as last month, though the situation is such that prices could be raised.

The lime trade is active. Sand supplies, both bank and river, are in good request. Accessories such as plaster, roofing and steel work and glass are in corresponding good local demand.

Biswanger & Co. of Memphis, were seen this morning by the ROCK PRODUCTS' correspondent. This firm is furnishing the glass on many of the warehouses going up over the city and they report good business in neighboring territory.

A five story family hotel is in embryo to stand on the north side of Madison avenue, opposite Forest Park. The cost will be $150,000.00 to $200,000.00. Interested in the enterprise are Mrs. Nannie W. C. Voorheis, S. F. McDonald, Robt. R. Priest, and others.

C. D. Smith & Co., Memphis Trust Building, are running considerable dirt moving and contracting work on southwestern railways at this time.

The Chickasaw Building Company has been incorporated at Memphis with $250,000.00 capital stock by J. N. Falls, J. Newberger, R. Dunscomb, C. H. Raine and John W. Falls. This is the company that will erect a twelve story building on Front street for the use of the cotton brokers. The building will also have a frontage on Court avenue.

The State Board of Education has awarded the contract for the West Tennessee Normal School to be built at Memphis, to James Alexander & Co. of Memphis. The price is $293,332.00. Geo. N. Moore & Co. of Nashville, Tenn., were awarded the contract for the Middle Tennessee School to be located at Murfreesboro, the price being $137,855.00.

H. P. Streicher & Co., Dunlap street, Memphis, have the contract for several concrete jobs, culvert and bridge contracts over the city.

J. A. Omberg, Jr., Goodwyn Institute, is doing some of the engineering work in connection with the site for the new Union Depot.

Architects Shaw and Pfeil, Tennessee Trust Building, drew the plans for the new $260,000.00 police station to be erected by the city of Memphis.

Engineers Kaucher and Hodges, Royal Building, are finishing their work on the new concrete building of Otto Schwill & Co, seed wholesalers.

Weathers-Foley Co., architects, Scimitar Building, has completed plans for a reinforced concrete loft building similar to the Kallaher building they lately completed on McCall street, this new structure to stand on Jefferson avenue. It will be known as the Lotus Building, erected by the Syndicate Building Company. There will be no offices in the building and it will be used for light manufacturing purposes. The lot measures 90½' by 112½'. The building will be twelve stories high. The architects said to the ROCK PRODUCTS correspondent today that all the details of the plans had been completed and that the work would probably be in progress between now and the first of the year. The same architectural company has drawings for several court houses in the States of Arkansas and Mississippi.

The Wright Lime & Cement Co. have moved into their new offices at 94 S. Second street and have transferred their warehouse to a new building erected expressly for their purposes at Willett avenue and the N. C. and St. L. R. R. Mr. Wright reports the market fair, with cement firm and outlook for a firmer market. The new warehouse of this company previously referred to in this paper is a gem in every respect.

The Fischer Lime & Cement Co. will get into their new building in December. It covers something like a block on the Southern R. R. at Pontotoc and Walnut streets, with superb railroad facilities. Their present yard may be retained and their various branch connections in the city. But the chief business of theirs in lime, cement, sand, plaster and building supplies, together with the general offices that do a business with all West Tennessee, North Mississippi and Eastern Arkansas will be centered at the new building in December.

The Deal Company, of New York, N. Y., has been organized to deal in building materials, roofing materials, pipe and boiler coverings, asbestos, etc.; capital $100,000.00. Incorporators: Edward H. Crabbs, 116 Liberty street, New York; John H. Stoddard, 135 Broadway, New York; Elvin C. Routzahn, 116 Liberty street, New York.

CLEVELAND RETAILERS.

Cleveland, O., Sept. 16.—Business with the various retailers and supply companies during the past month has been exceedingly brisk, according to reports made at the different offices. There has been a steady movement of cement and the call for plaster, brick and fireproofing materials has been quite brisk. It is generally believed that business will continue on well to the holiday period, providing climatic conditions are favorable.

A new supply company was launched during the past month, when W. A. Fay, formerly manager of the Masons' Supply Company, started into business for himself, under the title of the W. A. Fay Builders' Supply Company, with offices in the Scofield building. The Masons' Supply Company was absorbed by the Cleveland Builders' Supply Company last year when Mr. Fay became manager of the larger concern. Later he accepted a similar position with the Lake Erie Supply Company. Now he has decided to go into business for himself. He has taken with him from the Lake Erie Company John Leonard, who has been in charge of the brick department. He will look after the same work in the new office.

"We expect to conduct a general building supply business," said Mr. Fay. "There is a good field in Cleveland for this line of work. With so many factories, mills and quarries to draw from, the business in this territory is fairly well distributed."

The Cleveland Builders' Supply Company, the biggest concern of its kind in the country, reports an excellent month's business. In the brick department especially has there been a lot of business done. Brick is being furnished for the New Anshe Chesed temple, some 250,000 Bokharas being required for the job. About 130,000 shale and pressed brick are being furnished for the new Hodge public school and 30,000 Sparta glazed brick for the new technical high school and 120,000 Wadsworth shale brick for a new school at Fairport, O., in addition to a number of other big jobs.

W. A. FAY, OF THE W. A. FAY BUILDERS' SUPPLY COMPANY, CLEVELAND, OHIO.

Robert L. Beck, dealer in builders' supplies, reports business as quite active. One contract on which deliveries began during the past month was 30,000 Bessemer shale brick for the addition to the technical high school. The demand for other lines of supplies is also very brisk, according to Mr. Beck.

Bert Graham, for several years manager of the fireproofing materials and brick department of the Cleveland Builders' Supply Company, has resigned his position to become city salesman for the Ohio Clay Company, a concern with which he was formerly connected. Robert C. Mitchell has been named to succeed to Mr. Graham's place. Mr. Graham is secretary of the Ohio Builders' Supply Dealers' Association and very popular in the business. Mr. Mitchell, until a few weeks ago, was president and manager of the Contractors' Supply Company, which was recently absorbed by the Cleveland Builders' Supply Company.

Joseph Rowe, for some time past in the employ of the Lake Erie Supply Company, of this city, has been named as manager of the concern, succeeding W. A. Fay, who has gone into business for himself. Mr. Rowe reports that business is quite active and the outlook for the fall quite bright.

John F. McKay, formerly with the Cleveland Hydraulic Press Brick Company, has rejoined the company and is now city salesman for the concern.

TWIN CITIES RETAILERS.

Minneapolis, Minn., Sept. 19.—The fall building season is slow to take hold, due to the slowing up which is being experienced in financial and commercial lines generally. But the volume of building totals holds up well, almost wholly on small work, such as residences and small stores, and the comparisons so far have been favorable as against a year ago. But of the large structures, the new announcements are limited, and do not indicate that much heavy work is being taken up. Building trades are all busy at present finishing up work which has been under way.

Permanent improvements for Minneapolis are proposed next year to cost $339,000.00, of which $300,000.00 will go for sewers, curbs, gutters and sidewalks.

Minneapolis building permits for August were $1,370,605, against $1,312,570 for the same month of 1909. The total for the eight months of the year is $10,656,015 this year, against $9,019,040 for the same months of last year.

St. Paul permits for August amounted to $1,138,461, as compared with $1,222,051 for August of last year. For the eight months, the total this year is $7,380,828, against $7,597,246 for last year.

The Minneapolis Architectural Club is fitting up handsome new quarters in the Meyers Block, Nicollet avenue and Tenth street. The club will resume its activities next month, after having taken a vacation for the summer.

CHATTANOOGA RETAILERS.

Chattanooga, Tenn., Sept. 15.—Business has been a little quiet here but some work is now starting. The Hamilton National Bank skyscraper is under way and the Hamilton Court House is to be rebuilt soon. Contracts for five new school houses in this county have been awarded in the last few days as follows: Patten Chapel, P. O. Rodgers and Son, $5,637.00; East Side, A. W. Duncan, $5,563.00; Tyner, A. W. Duncan, $5,500.00; Retro, D. F. Brandon, $5,696.00; Fairmont, O. J. Carson, $5,740.00.

J. L. Haynes, at Decherd, Tenn., who is a dealer in builders' supplies, is preparing to erect a two story addition to his other buildings there. D. M. Powell, in the same town, is erecting a two story brick building.

The Gager Lime Company, James Building, were visited by your correspondent. The management reports September trade opening with promise. The facilities at Sherwood kilns are being somewhat enlarged.

The Converse Bridge Co., Chattanooga, is furnishing the steel for some reinforced concrete jobs over the South.

J. H. Bragg, at Chattanooga, has been awarded the contract for a concrete culvert on Madison street.

Sloan & Co., building supply dealers, report that trade has been quiet at Chattanooga but is beginning to improve.

The Dixie Portland Cement Company, James Building, reports trade gradually picking up over the southern and central states, the former under the inspiration, perhaps, of reasonable good crop conditions.

At Johnson City, Tenn., the ROCK PRODUCTS correspondent was shown an example of one of the finest concrete flour mill buildings in the South, the property of the Model Milling Co., J. W. Ring, president. The work was done by the McDonald Engineering Co. of Chicago.

At Johnson City, Tenn., the Brading-Marshall Lumber Co. is handling plaster, cement, sand and other building supplies as well as operating the Johnson City Brick Co. The firm reports local situation quiet.

COST SYSTEMS.

The cost system promulgated by W. A. Jordan, of the Charles Warner Company, of Wilmington, Del., elicited much favorable comment from retailers of builders' supplies generally. In printing the article it was impossible to give the forms in the exact sizes in which they are made and used on the color of the paper. Mr. Jordan will, upon request however, send to anyone interested samples of the various forms showing the exact sizes and the color of the paper.

THE NATIONAL BUILDING SUPPLY CO.

Baltimore, Md., Sept. 16.—"Business is good." That is the slogan which Harry P. Boyd, secretary of the National Building Supply Company of this city has established, and from indications the firm is following the example. The large establishment of the company on Pratt street is the scene every day of large shipments going out and from the number of contracts recently landed by the company it looks as if somebody is making money.

But that is only one concern. Nearly every large dealer in this city is hustling as they have never hustled before and everyone claims to be doing some business. The large amount of building which was contemplated during the spring and summer months is now well under way and Baltimore is experiencing more extensive building operations than ever before in its history.

"But the National Building Supply Company is going after more business than it ever did before," said Mr. Boyd. "We are tired of lagging behind with the small and larger fellows because of a question of prices. It has never done us any good and now it is time for a change.

"I have decided to make a complete change in the methods of this company and if the other people do not get up and hustle somebody is going to lose. It is not a question of holding out for high prices now, but a question of quick sales and plenty of them.

"This company has plenty of capital. We can buy in large quantities and for that reason the bulk of our business is expanding as it never has before. I can say without drawing any narrow margin that the business of the National Building Supply Company has increased 25 per cent in the past three months in comparison with that which was done last year.

"We are furnishing the cement for the most important jobs in the city and orders are coming in every day for more work which is now under way. We are using a large quantity of Security cement at this time and among some of the most important contracts we have sold that brand for the new sewerage system for the city, the cement for the Electrical Commissioner's subways, for the new $10,000,000.00 dock system, for the paving which comes through the office of the city engineer, the fifteen-story Fidelity building, the new eight-story addition to the building of the United Fidelity and Guaranty Company and the new pumping stations for the city, both sewerage and high pressure fire system. Both buildings will cost over half a million dollars.

"Among some of the largest and most important jobs we are furnishing Atlas cement for the new Emerson Hotel and the new Munsey Building, which will be the home of the Baltimore News. Each structure will be over fifteen stories high and will cost over $1,000,000.00. The buildings are opposite to each other."

RETAILERS IN NASHVILLE AND THE SOUTHEAST.

Nashville, Tenn., Sept. 15.—Trade looks active enough with the supply firms around Nashville. The bridge and steel construction interests here are also active.

Geo. C. Moore and Sons have the general contract running above $100,000.00 on the Middle Tennessee Normal School.

The Nashville Builders Supply Co., at the foot of Church street, have a large trade on cement this month and find the market firm.

Hoover & Co. are finishing the plastering contract on the Hermitage Hotel and other large structures.

The contract for the curbing and paving of the Charlotte road in front of the West Nashville police headquarters was recently awarded to the Nashville Roofing and Paving Co.

The Allen-Scales Engineering Co. has opened offices in the Stahlmann Building. Harwell Allen and E. P. Scales are the members of the firm. The company will do general work but will specialize on power plants.

Archt. C. K. Colley here drew the plans for the rebuilding of the Davidson County Court House, which is concrete from top to bottom.

A CORRECTION.

Through an error in the types of the last edition of ROCK PRODUCTS, we mentioned the name of the Acme Coal and Builders Supply Company, of Toledo, O., incorrectly, calling it the Acme Coal and Lumber Company. This is one of those errors that creep into even the best regulated families. F. B. Jones, general manager and secretary of this concern, is one of the wide awake members of the Ohio Builders Supply Association, always on the job, and this little error is one of those things that are to be regretted.

BIRMINGHAM RETAILERS.

Birmingham, Ala., Sept. 20.—Never since the financial disturbance of 1907 has business among the building material and supply men of Birmingham been better for this season of the year. Prices are more stationary and have not the former tendency of varying in surprising degrees, which fact may be attributed in great part to the good work of the Exchange.

The business of the retailer depends, of course, upon the activity of building conditions, and, therefore, it may not be amiss to give a few statistics obtained from the building inspector of this city. According to that official, the building operations in Birmingham for the first eight months of 1910 eclipse the record of operations for any twelve months in the history of this city. The greatest building record ever made before this year was in 1908, when permits to the amount of $2,576,119.00

OFFICE AND WAREHOUSE OF J. F. BALDWIN, BIRMINGHAM, ALA.

were let, but already the first eight months of 1910 exceed this amount by some $200,000.00, as the permits issued during this year ending August 31st aggregate $2,745,941.00. The contrast becomes more marked when it is seen that the first eight months of 1910 exceed, by something like $1,000,000.00, the same period of 1909, and that the first eight months of 1910 exceed by about $400,000.00 the entire year of 1909. The following are the building figures month by month, 1910, as compared with 1909:

	1910.	1909.
January	$189,884.00	$220,090.00
February	274,867.00	182,840.00
March	448,957.00	158,847.00
April	367,428.00	274,415.00
May	350,487.00	242,487.00
June	304,224.00	196,718.00
July	305,039.00	334,498.00
August	305,055.00	165,364.00
Total	$2,745,941.00	$1,775,259.00

One of the best known and most enterprising firms of this district engaged in the handling of building materials is the Tulenwider Building

OFFICE OF THE DUN & LALLANDE BROTHERS CONTRACTING COMPANY, BIRMINGHAM, ALA.

Material Company of Birmingham. This concern is incorporated, and has the following officers: President, Robert Tulenwider; vice president, H. Tulenwider; secretary, G. Kenimer; treasurer, O. E. Kenimer. The nucleus of the business was founded about twenty-four years ago but, with the passing of time, different additions have been made until now it has become one of the best known companies of the state. Among the well known brands of goods which this concern handles are: Royal Portland Cement, Monarch Plaster, Longview Lime and Cheney Marble White Lime. The offices of the company are in the Empire Building in the heart of the city, and a large force is always kept busy here managing the affairs of the firm. The warehouses of the concern are located at Thirty-sixth street and Bibb avenue, East Birmingham. In addition to storing facilities, there are also iron roofing, concrete blocks and wood working plants, a lumber yard and sheet metal works. H. Tulenwider, in an interview with the ROCK PRODUCTS' correspondent, had the following to say: "Business conditions are very good, in fact better than they have been in a long time, while the outlook is as bright as it can be. In my opinion this will be a banner year in our line on account of the rejuvenation in building operations. Yes, I heartily believe in building associations, and I think that the local exchange has done very much good." Among the deals of the month most worthy of mention are: The sale of $9,000.00 worth of a general line of building materials to the Farmers' and Ginners' Cotton Oil Co., two solid cars of Monarch Plaster for the J. B. Cunningham School, and two cars of Monarch Plaster for the bank and hotel building at Corey.

The Carolina Portland Cement Company reports very good business for the last month. Mr. Walker, of the company, had the following to say: "Prices are in a very fair state at the present time and there is a good demand for materials. Among our large sales for the month are 15,000 barrels of cement to a prominent iron company, and a very large amount of the same material for the Corey construction work."

Archt. Harry B. Wheelock has completed his design of the Y. M. C. A. building, and the plans are ready to be placed in the hands of the contractor. When completed this building of sky-scraper proportions will be one of the most magnificent structures of its kind in the South.

The city of Birmingham has decided to erect a fire station at Third avenue and Fifteenth street, at a cost of $10,000.00.

J. W. Altman has awarded to the Joy Construction Company the contract for the erection of a two story brick residence to cost $8,000.00.

Among the retail building material men of Birmingham none is better known than J. F. Baldwin, whose office and warehouse is situated at 2217-19 Morris avenue. Although most of the business of this firm consists in supplying small operations, occasionally some large orders are filled. Business this month has been very good, and the largest sales were made in connection with the construction of the new wing of the St. Vincent's Hospital of this city. Among the materials sold to this corporation, the following are particularly worthy of mention: 30 carloads of sand, 1,000 barrels of cement, about 700 barrels of hydrated lime and a large amount of plaster. "I have never had better summer trade," is what Mr. Baldwin had to say regarding business conditions. When asked for his views on the work of association, he replied: "Associations are always beneficial, it matters not in what profession or line of business. The local exchange has done good work. While there has been no formal agreement between the dealers, regarding the prices, still, the organization has prevented us from giving away our goods for almost nothing."

The Building Material Men's Exchange of Jefferson County held its regular meeting on Sept. 8th. After the disposal of business, a short smoker was held.

The second annual banquet of the Exchange will be held at the Country Club on the 13th of October. About seventy-five members of the organization, in addition to about fifty invited guests, will gather around the festal board to eat and listen to the flow of wit. This occasion promises to be a great success. According to Mr. Forbes, the secretary, the condition of the Exchange is gradually improving, and new members are being added to the rolls continually. In the reception room of the exchange is a long table covered with periodicals of the trade, and very conspicuous among these journals are copies of ROCK PRODUCTS. So valuable are the copies of this periodical considered that after lying on the table for a month they are sent to the Public Library, where they are placed on file open to public inspection.

One of the most prominent railroad and concrete contracting companies in the state of Alabama is the firm of Dun & Lallande Brothers, of Birmingham. This company has perhaps done more in its line of work than any other in the district, and the continual expansion of its business is a fitting tribute to the manner in which it is conducted. A specialty of this firm is municipal work, and almost every large city in the South has given it its share of patronage. Some notable work is being done at the present time at Corey, where the company is doing a general line of street improvement jobs.

The offices of the company, located at First Avenue and Twentieth Street, are in charge of E. G. Dun, a gentleman of the old school, whose Chesterfieldian manner and genial humor, so far removed from the average business man of today, make it a great pleasure to meet him. Mr. Dun said: "During the twenty years of our existence we have met with great success, but the prospects of coming years are still brighter. We have plenty to do and are satisfied."

LOUISVILLE RETAILERS.

Louisville, Ky., Sept. 20.—Those interested in the building situation in Louisville are finding much to encourage them just now. The volume of business is here, and with few exceptions prices are good and all factors favorable. The outlook is for a heavy fall, as a lot of big projects are under way and the contractors are anxious to close up as long before bad weather sets in as possible. This has meant the multiplication of orders, and September has been one of the big months of the year.

One of the features of the situation continues to be the strength of cement. As pig iron is the barometer of general conditions, so may cement be said to be the barometer of the building trade interests. Cement happens to be in better demand just now than for several years, with more orders in the hands of the mills than they can fill. Stocks are low, and practically no surplus is being carried locally, so that it is easy to see that the consumption has been heavy. The stiff prices which have been the rule for the past six months are continuing, although no further advances have been noted during the past thirty days.

Those in the roofing material business report an active month, while clay products, such as brick, tile and drain pipe, are selling well. Sewer pipe is in exceptionally good demand, due largely to local conditions, involving the construction of many small lateral sewers in which pipe can be used to advantage.

The figures on building in Louisville for the city's fiscal year, which ended August 31, will bear inspection. The report of the building inspector showed a total of 2,448 permits issued, as against 2,984 for the previous year, but the total expended in construction was $3,996,000, a gain of $1,100,000 over the preceding twelve months. The character of the building was shown by the fact that twenty permits were issued for apartment houses, seventeen for factories and nineteen for warehouses.

Some of the big jobs, either in course of construction or planned for immediate construction, are the new First Christian church, the Snead manufacturing building, the new Broadway school building, the Business Women's Club building and the new buildings of the Standard Sanitary Manufacturing Company, of which several have been put up recently. Another building of consequence which is being talked of is an auditorium. It is to be erected on Fourth avenue, south of Walnut, and if plans now being made are carried out, it will cost more than $500,000. John P. Starks is aiding in the raising of a fund for this purpose.

John L. Wheat, of the Union Cement & Lime Company, said that conditions are first rate, and that lots of Lehigh cement is being sold in this market by his company. While no especially large contracts have been let recently, the number of smaller jobs is keeping business up to the standard. Mr Wheat said that the new mechanics' lien law, which was passed by the State Legislature last winter, is a disadvantage to the builders' supply man, because it requires immediate notice to secure the exercise of a lien. "ROCK PRODUCTS is just as interesting as ever," said Mr. Wheat, as the Louisville correspondent was leaving his office.

A fine demand for cement is noted by J. B. Speed & Co., which reported, however, that a car shortage of no mean proportions is interfering with shipments. The mill had an order for twenty-five cars in one day this week and received exactly one. This condition, it is believed, is likely to get worse instead of better as the season grows later, so that, as no large surplus stocks are held anywhere, there may be a shortage of cement.

The National Roofing & Supply Company, said President Snyder, is doing a good business in builders' supplies and in roofing. Edward Strecher, of this company, was in Shelbyville when the ROCK PRODUCTS man called, having gone to the Shelby capital to superintend laying down an exceptionally big roofing job.

"The Louisville Fire Brick Works," said K. W. Grahn, head of the company, "notes a slight improvement in the pig iron situation but," he continued, "something is holding back business." He attributes it to the desire of the railroads to put up rates, and said that in order to be allowed to do that they are holding back their orders and thus hampering business. One outstanding feature noted by Mr. Grahn is the increased activity of the cement mills, which, he said, are having hard work filling their orders. They are buying fire brick freely.

President Bishop, of the Southern Brick & Tile Company, said that the demand for all grades of brick is good. His company is furnishing a million and a half brick being used in the addition to the Sts. Mary and Elizabeth Hospital. The company is also interested in plans for the construction of a big open ditch for the drainage of a large portion of Jefferson county south of the city, the work to be undertaken by the Fiscal Court. This is expected to make a large section heretofore unavailable of much value, and should also stimulate the demand for drain pipe for use on that land.

Burrell & Walker are not finding the demand for flue lining, drain pipe and other clay products as good as they would like to see it, but say that the factory reports conditions here better than in most markets, so that the local situation is evidently better than the average.

The P. Bannon Sewer Pipe Company has again secured the contract to furnish the sewer pipe consumed by the city during the new fiscal year, but the price was lower than ever quoted here before. The Louisville Brick Company got the contract for the brick to be used on the streets and in repairing sewers, some close figuring being done on this contract.

Most of the building supply men were on hand at the annual outing of the Builders' Exchange, which was held at Hike's Point on Labor day. Games of all sorts were on the program, and they were carried out to the letter. Those who attended pronounced it one of the most successful outings of the kind ever held by the exchange. J. M. Vollmer, secretary of the Builders' Exchange, has issued a year-book of general interest to contractors and supply men. It contains a directory of the trade and a digest of laws affecting the business.

The E. T. Lewis Company, of Nashville, has been awarded the contract for constructing a sewerage system in Winchester, Ky. The successful bid was just under $40,000. The city has issued $65,000 of bonds for the purpose of financing the work.

The plant of the Kleymeyer-Klutey Brick & Tile Company, of Henderson, Ky., was damaged by fire recently to the extent of $2,000.

Willis E. Smith, of Owensboro, has been awarded a patent on a tile-cutting machine.

Lewis Girdler, superintendent of the Union Cement & Lime Company, in Jeffersonville, is planning to stock with fish several lakes at Belknap, in southern Indiana. The lakes were formed in abandoned quarries formerly used in supplying material for the manufacture of hydraulic cement.

SAN FRANCISCO RETAILERS.

San Francisco, Cal., Sept. 17.—The general business for the last month has been satisfactory as compared with the earlier part of the season, though in the city itself the demand for building materials has been much smaller than a year ago. The retailers in surrounding towns are faring somewhat better, but have, as a rule, been unable to keep up with last year's records. Prices on cement, lime and rock show little variation. The brick market has been a little stronger than in the earlier part of the year, but the price is still too low to be satisfactory.

The valuation of building permits for August was $1,525,705, a slight increase over July, but still far below the record of August, 1909, and less than several spring months this year. There is a large amount of concrete construction, however, and a number of good-sized plastering contracts are under way. Dealers believe that indications are favorable for a further improvement between now and the beginning of the rainy season, and the volume of business will be increased by contracts about to be let on a number of schools and other public buildings. In other California cities there is less activity than last summer, but conditions show considerable improvement over the last few months, while in Oregon and Washington the market is more active than ever before.

DETROIT RETAILERS.

Detroit, Mich., Sept. 19.—With the advent of cooler weather, Detroit and Michigan building supply dealers report improved conditions. Not saying the summer was not an active period for construction work, but in the course of events it is natural for operations of this sort to be rushed during the cooler periods. Different Portland cement plants throughout the state have been running overtime during the last few weeks in an effort to supply the demand. There have been no changes in quotations during the month, but the market has already reached a high point and one that is entirely satisfactory to manufacturers, wholesalers and retailers. Cement is now quoted at $1.25, f. o. b. Detroit.

The Builders' & Traders' Exchange, of Detroit, is preparing to issue a booklet telling what it does for the membership and the trade generally, and this bulletin will be mailed to business men throughout the city. According to the local Bulletin News, eighty new members have been added to the roster during the year, and it is expected to make the number one hundred before the beginning of another season. On building conditions it agrees with ROCK PRODUCTS that the situation looks favorable for a continuance of good conditions in building trades for the fall and early winter. W. G. Thomas and John Lennane have resigned from the board of directors and A. P. Ternes, president of the Ternes Coal & Lumber Company, has been elected to fill one of the vacancies.

Building supply dealers throughout the city are deeply interested in the forthcoming report of the committee on ordinances of the Detroit common council. The council will hear the report in its amended form at its next meeting, and another hearing will be given September 29. One of the points in contest is the fiber stress to be allowed for on steel in reinforced concrete construction. The code as originally drafted called for 16,000 pounds to the square inch, but it was later amended to 20,000 pounds to the square inch. Representatives of the Trussed Concrete Steel Company have protested against this change and the committee has decided to submit the question to a number of disinterested engineers throughout the country.

ST. LOUIS RETAILERS.

St. Louis, Sept. 17.—The leading manufacturers and dealers in building material, particularly in case of cement, report an excellent demand coming both from local and outside sources. While not yet in evidence, there is some expectation of finding, later on, delay arising from car shortage. The settlement of the Illinois coal miners' strike relieves manufacturers of anxiety regarding their supply of coal. Money has been in good demand, causing some advance in rates, but after the crops are moved, funds will drift back again to the centers. A feature of the local situation is the increase in manufacturing, the special efforts of mercantile associations having met with good success, and several new companies are erecting plants. In addition to this, a number of old concerns have largely increased the capacity of their factories. An emphatic indication of the large volume of business being done in St. Louis this year is shown by the fact of an excess in receipts and shipments of commodities of nearly a million tons during the first six months of 1910 over those of any previous half year in the history of the city.

Mr. Willis, of Hunkins-Willis Lime & Cement Company, states that there is an excellent demand for lime, cement and plaster, which is distributed over these three materials in about the usual proportion. In some lines of building materials Mr. Willis says there is difficulty in getting supplies fast enough to meet the demand, and he considers the outlook for building this fall as good, both in and out of town. Country collections are rather slow in coming in, doubtless owing to the crop moving season being on and money in large demand in consequence.

Manager McDonald, of the Independent Lime & Cement Company, reports trade as keeping up in volume, there being a large number of buildings going up and a great amount of sidewalk construction. The company makes a special effort to fill orders with the utmost promptness. Mr. McDonald's experience as a contractor makes him wise in this respect, since he knows how the cost of a job is enhanced by workmen lying around idle because some kind of material is delayed in delivery.

CHICAGO RETAILERS.

Chicago, Sept. 21.—This month, in which business was expected to pick up among builders' supplies dealers, proved only partially satisfactory. There were days when orders came in nicely, which gave rise to hopes that the inactivity of the summer months was past, but up to the present time these hopes have not been justified. Building operations this fall are backward, especially is this the case in the northern section of Chicago, where it is reported loans are difficult to effect. The western and northwestern sections of the city do not seem to be affected by these conditions, as small residences and buildings of various characters are being built in as great numbers as was anticipated. There is some complaint heard about slow collections. Conditions, however, are fair, but no great rush of business is anticipated by the dealers in building material this fall.

Business up to August 1 was reported good and steady at the offices of the Knickerbocker Ice Company. The volume of trade of builders' supplies sold compared favorably with that of last year; in fact, was greater. But since August business declined materially, more so than it did last year at this time, and has not yet come up to the volume

of trade during the spring months, as was expected. Occasional spurts this month in business, however, indicate that September probably will make as good a showing as the months in the busy forepart of the year. Building operations in the territory of their "inner yards" show that flat buildings are not going up in as great numbers as the forepart of this year, while small residences in the outskirts of the city, in the territory of their "outer yards" are being built, showing no decrease from last spring.

While no great increase in business is felt this month by the Wisconsin Lime & Cement Company, it is reported as holding its own with August and July. The many yards of this company scattered throughout the city are all fairly busy and the outlook for fall is believed to be all right.

Business was slow for the past thirty days with the Tuthill Building Material Company and is not picking up as fast this month as expected. There is a marked falling off in the erection of flat buildings so far this fall and a not very active fall trade is anticipated by this concern. Conditions are reported fairly good, however, and business commencing next month will keep dealers in building materials quite busy this fall.

Matt A. Mueller, president of the Lake Building Material Company, at 2144 West Forty-seventh street, said: "Business is good for this time of the year and the outlook for fall fair. All this month, when we believed our teams would be idle, some big orders would come in and every team be pressed into service. That is the way business has been in September. There is a good deal of building going on in our territory."

"Conditions in the trade of builders' supplies are not very cheering," said Walter L. Woods, president and treasurer of the Standard Material Company, at Sixty-sixth street and Lowe avenue. "Business was slow July and August and shows little activity this month. There are many small residences going up in our territory, but they do not require much building material exceeding plaster. Much talk is heard among contractors about building operations this fall, but so far no contracts have been given around here. I do not doubt but what there will be a fair business, commencing October 1, but nothing of a rushing character."

At the Crescent Material Company, Sixty-fifth street and Lowe avenue, trade was dull. It was expected to pick up this month, but business has shown no improvement so far. Conditions in the builders' supplies business give no indications of any great activity the coming month.

"Architects and contractors are doing quite a little figuring," said H. O. Heitmann, president of the Union Coal, Lime and Cement Company, at Fifty-ninth street and Ashland avenue. "Contractors, however, around this neighborhood do not believe there will be much activity in building lines this fall. There are a number of little houses going up, but big jobs are not materializing as usual at this period of the year. Business has been slow this month and shows no sign of picking up much. Of course, we are busy but could do much more."

"This month the demand for crushed stone and also for torpedo sand was slow on account of inactivity in building operations throughout the city," said Michael Ready, of Ready & Callaghan. "While our yards at Forty-seventh street and Seventy-fifth street, both at the corners of Halsted street, are kept fairly busy, I don't expect a great deal from the fall months this year."

"Business is good, collections are a little bit slow this month," said T. M. Tobin, of the T. M. Tobin Brothers Company, 9354 South Chicago avenue. "In the retail business money is tightening up, in that way perhaps we feel the letting out of some steel men at the rolling mills here. There is much concrete sidewalk work done here, more than there has been in years, and that eats up cement fast. Quite a number of business blocks are being built this fall and residences north of here. The only thing we have to complain about is track elevation, which makes deliveries of builders' supplies difficult."

"We have been busy for the past two months, and had no idle teams on our hands," said Charles P. Thompson, of the Calumet Coal & Teaming Company, Ninety-fifth street and Exchange avenue, South Chicago. "But unless we have as many hired teams hauling as we own ourselves, which is fifteen in number, we don't feel we are doing a good business. Prospects are not very promising for much building around here. We are doing a good business at our Seventy-fifth street and Bennett avenue yard, near Windsor Park an South Shore, where quite a number of residences and bungalows are being built. Collections are just fair."

O. H. Hanson, manager of the Circuit Supply Company, said: "Business has been pretty good since July, but there are no indications of any great activity in building operations for this fall. There is quite a bit of building in this neighborhood, consisting of two and three-story flat buildings and a Polish church at Eighty-third street and Saginaw avenue. We furnished some material for the church. Collections are nothing to complain of, for this time of the year."

"Collections are slow and business has not picked up as we expected it would this month," said Otto Frerk, of Henry Frerk Sons, 3101 Belmont avenue. "Prospects do not seem to be as bright as they should be this fall; building operations are not over heavy. Most of our business is outside of our territory and our deliveries therefore are long hauls. It looks as though there will be a fair business next month, at any rate we shall keep busy."

"For some reason business is holding back this month," said N. J. Druecker, of N. J. Druecker & Co., 2628 North Artesian avenue. "There is very little building done in this neighborhood and prospects for an active business are not bright this fall. Conditions are not bad and collections are fair."

"Trade has picked up nicely since August," said A. L. Halleman, secretary and treasurer of the Templeton Lime Company, at Homan and Grand avenues. "We have all we can do and are looking around to hire teams, which are hard to get. Collections are rather slow. There is much building done in this neighborhood and prospects look bright for a good business this fall."

Farley, Koch & Co., at 445 North Fortieth avenue, reported business good and that they had all they could do this month. They report building operations active in their neighborhood; collections good and a bright prospect for brisk business this fall.

"We are selling more of our concrete blocks for foundations and superstructures than usual at this time of the year," said P. T. Brett, of the J. J. Croake Company, 2931 Fullerton avenue. "There are many store and six and eight-room flat buildings being erected around here, and everything looks good for fall. Collections are fair."

Business was found quiet with Jas. E. Lill, at 1225 Bryn Mawr avenue, with no immediate indications of its livening up. Collections, while not exactly poor, are by no means good. There is not much building done in flat buildings in the north section of Chicago. He is doing a fair business but it is by no means brisk.

"Things are quiet if not exactly dull," said J. M. Bower, manager of the Waukesha Lime & Stone Company's yard at Devon avenue and Sheridan road. "Up in this section of the city there are few building permits out, which will practically include the territory north of Belmont avenue. Collections are not extra good and business does not seem to pick up much this month."

Every team was reported busy and business brisk at the M. A. Staley Company, 1128 Cornelia avenue. There are a number of large jobs ready to be started and many small buildings are going up in this vicinity. Prospects for fall were reported good and conditions in the trade fair.

E. J. Winslow, of the Hydrolithic Cement Company, stated: "Business with us continues to rush; the demand for our waterproofing product is such as to keep us on the keen jump. Prospects for this fall look very bright and we are satisfied with existing conditions."

CHICAGO CEMENT NEWS.

Chicago, Sept. 21.—September's volume of trade in the cement industry was quite up to the mark set by manufacturers. The demand for cement this fall was a few days late, compared with last year, but is now fully up to expectations, with indications that it will remain active till late in the fall. Mills throughout the country have little stock in reserve and are running to full capacity. Prices are uniformly steady and showing little tendency to a lower level. Conditions remain in every respect as good as they were several months ago. While the demand in large cities has fallen off some, country districts, now that harvesting is over, send in orders that more than offset any slacking of demand in large communities. Cement manufacturers continue to feel cheerful, believing that prospects for a good fall business are bright.

George W. DeSmet, distributor of Vulcanite Portland cement, said: "I have been very busy the past two months and September looks good. There is practically the same good demand for cement as in the past, and prices are steady. There is nothing to complain of in the conditions of the cement trade and we should not discount any trouble in the future."

"From a manufacturer's point of view, business is very satisfactory," said William Dickinson, vice-president in charge of sales of the Marquette Cement Manufacturing Company. "In the territory we serve, September will be the biggest month this year. No decrease is shown in the demand for cement, prices are quite steady and there is no inclination to lower them. The fall demand for cement came ten days later than usual, but now it is fully up to expectation and perhaps a trifle better."

It was reported at the offices of the German-American Portland Cement Works, of which Edward L. Cox is general sales agent, that the concern has lots of orders and hustling to keep up its shipments. The demand for cement is as great as in the past and conditions are considered very satisfactory.

"In country districts the demand for cement is keeping up well," said B. F. Affleck, sales manager of the Universal Portland Cement Company. "While in the large cities there is some slacking off, prices are consistently steady and business is picking up nicely this month. Conditions in every respect are good and prospects fair."

At the Chicago office of the Atlas Portland Cement Company it was reported that the demand was keeping up fairly well, business picking up materially since the middle of September and no weakening shown in present prices.

J. U. C. McDaniel, traffic manager of the Chicago Portland Cement Company, said, with a smile: "The demand for cement is heavy this month, as usual, and everybody who wants cement, wants it yesterday. Farmers are now commencing to 'go to it' fast and fierce and there will be no let-up until cold weather sets in. The demand in the country districts is heavier than ever. Prices are steady and prospects are good."

At the office of the western branch of the Alpha Portland Cement Company the demand for cement was reported as good as last month. No let-up, it was said, was noticed in it, and conditions in the trade are quite satisfactory. Prices are steady and, from all indications at present, prospects for a good business this fall are assured.

William Dickinson, vice-president of the Marquette Cement Manufacturing Company, spent four months of the spring and summer in England, Belgium and Holland. He returned to Chicago three weeks ago in splendid health, showing that he greatly enjoyed his vacation abroad.

Gold Williams, Chicago representative of the Marquette Cement Manufacturing Company, is taking a three weeks' vacation on the Pacific Coast, which, his friends say, he has richly earned by exceedingly hard work last spring.

J. B. Tuthill, president of the Tuthill Building Material Company, is again at his desk, fully recovered in health. He had a long siege of illness, commencing in the spring months, and many of his friends became anxious concerning his recovery at one time. These fears have happily been dispelled by his robust appearance and cheerful spirit, as he greets them in his office.

John G. Evans, of the Atlas Portland Cement Company, has been enjoying his vacation on a farm in Ohio for two weeks. He returns to Chicago the latter part of this week.

CHICAGO SAND AND GRAVEL NEWS.

Chicago, Sept. 22.—Conditions in the sand and gravel trade for September remain unchanged from those prevailing for the last two months. Business has been quiet and there is no increased demand, except that which naturally comes at the beginning of the fall season. The volume of trade has been fair and prices, though low, are good, considering the sharp competition experienced throughout the entire building season of the year.

It was found at the office of the Atwood-Davis Sand and Gravel Company that business is picking up this month, as it always does at the commencement of the building season in the fall. Prospects are considered good for the months before the "freeze." Prices are low, though fair when considering the lively competition that exists.

C. H. Stebbins, of the Lake Shore Sand Company, said: "September is beginning to give us fair business. Shipments have increased fully 30 per cent over those of July, and indications are that sand people will be kept quite busy to the end of the season this year. Prices are steady.

P. M. Richardson, of the Richardson Sand Company, stated that there is not as much business being done this month as during the same period last year, but things are picking up.

"Prospects for rushing business this fall are not very bright," said P. M. Lewis, secretary of the American Sand and Gravel Company. "There will be, I believe, a good, fair business during the coming three months, but not any better than last year. There is a good demand for torpedo sand. Shipments are heavier and prices low, but steady."

AFTERMATH OF CEDAR POINT.

There has always been, in the month of August, more or less mystery as to what makes the editor of ROCK PRODUCTS so restless up to the time he leaves for parts unknown.

For the benefit of the office boys, some of the creditors and customers, we are specifically giving details as to what becomes of him. He goes to Toledo; goes up to the Yacht Club; goes aboard the Czarina, a fifty-four foot sloop yacht owned by A. H. Gallagher, of Toledo, O., and Frank Culver, of Port Clinton, two of the liveliest men in the plaster retarder business. This year it was a repetition of former good times.

The crew this year was composed of A. H. Gallagher; Charlie O'Donnell, of the Buckeye Portland Cement Company, Bellefontaine, O.; Chris Meyers, proprietor of the Meyer House, Toledo; George Frey, an old "tar," and the writer. We had additions to the crew from time to time, including a couple of shanghaied individuals known as Philson and Albaugh. Others who served time on the Czarina were W. A. Fay, of Cleveland; H. W. Blockson, of Pittsburg; Frank Holland, of Cleveland; Charlie Bigsby, of Cleveland, and C. E. Cochran, of Pittsburg.

The Czarina's voyage included a visit to the ports of Put In Bay, Cedar Point, Sandusky and a number of other points of interest on Lake Erie. Our admiral, A. H. Gallagher, is a regular old sea dog. He sails the ship, runs the engine, makes the best hash on earth, makes the beds, in fact, he is the "workingest" individual that ever stepped aboard a ship. O'Donnell is a good deal the same kind of a sea dog, but he is older. Chris Meyers runs a hotel and, therefore, is an expert on anything that is to be done. With Philson and Albaugh doing most of the dish washing, there was nothing left for the writer to do but carry water and scrub the decks, except when we got into a heavy sea, and then it was necessary to save the ship sometimes, for Philson was always talking about going up front and he had a hard time to decipher the difference between the "jib" and the "jigger."

The Czarina was one of the principal attractions at the Ohio Builders' Supply convention, as a number of the delegates always have a sail or two, and this year was no exception. Two moonlight excursions made possible the enthusing of a lot of landlubbers on the question of deep water transportation, especially a sail boat with an auxiliary which is sometimes used on the Czarina as a table where the best kind of food is served three times a day.

Frank Culver passed us by this year and, instead, took his vacation in an automobile, going to Williamsport, Pa., accompanied by his family.

Frank Griswold, general manager of the American Gypsum Company, Port Clinton, reported very by all his sons. His new concern, the F. Hunter & Sons Company, is doing a nice builders' supply business.

Our old friend Frank Hunter was accompanied satisfactory business.

Charlie Schmutz, of the Crescent Portland Cement Company, Wampum, Pa., reports the new plant as the greatest ever, and that their volume of business is good.

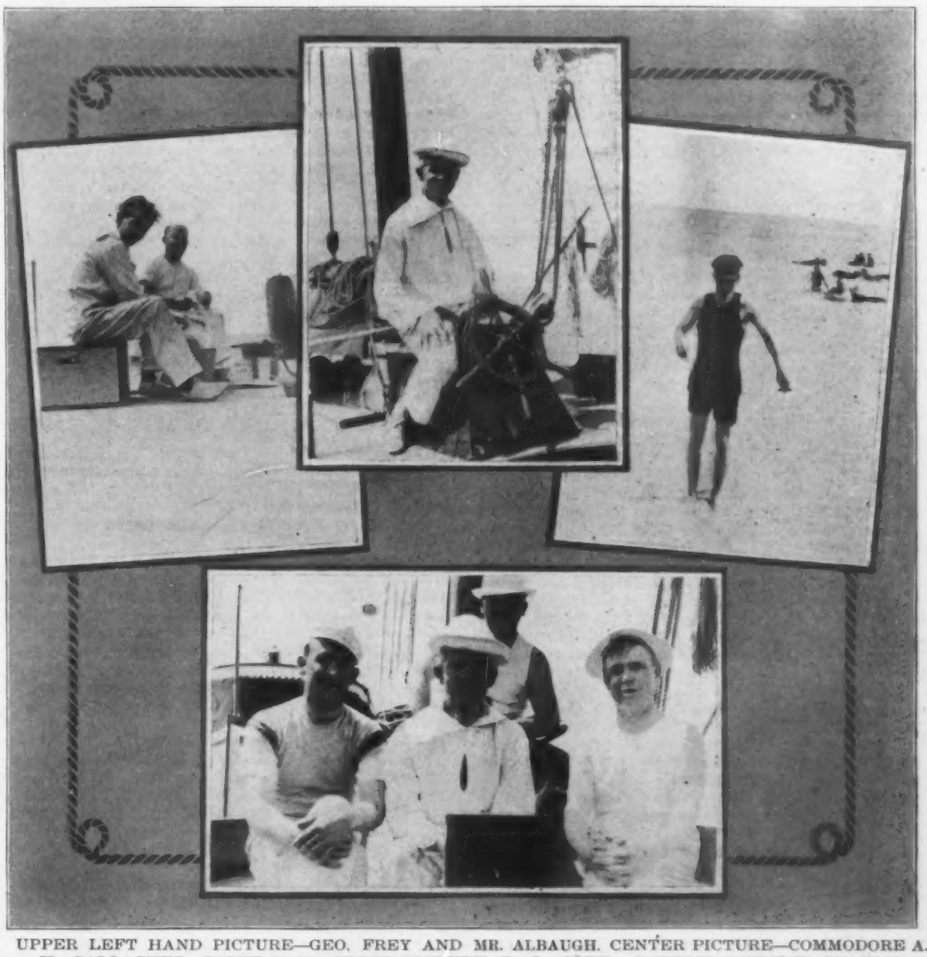
Fred J. Crisp, of the Akron Storage & Coal Company, Akron, is satisfied with the season's business.

Billy Knight, of the "Grip," drawing his pay from the American Gypsum Company, Port Clinton, is the most entertaining shipmate you ever met. It is a wonder some of these big opera companies do not sign him to sing "Mezzo" soprano.

MEET IN ST. LOUIS.

The American Society of Engineering Contractors, of which D. E. Baxter, of 27 William street, New York City, is president, and D. J. Haner secretary, will hold their annual convention in St. Louis on September 27, 28 and 29, in the Coliseum. The local committee of arrangements is E. H. Abadie, chairman; J. L. Westlake, W. C. Swartout and L. C. F. Metzger.

Papers will be delivered by J. B. Goldsborough and Ed. Wegmann, both of New York, on Dam Construction for City Water Supplies, and by George C. Warren of Boston, on Work Preliminary to Street Paving and Road Work. A banquet will be held, and several sight-seeing trips will be made to important work in and around St. Louis.



UPPER LEFT HAND PICTURE—GEO. FREY AND MR. ALBAUGH. CENTER PICTURE—COMMODORE A. H. GALLAGHER. RIGHT HAND UPPER PICTURE—R. L. COPE. BOTTOM PICTURE—CHARLIE O'DONNELL, E. H. DEFEBAUGH, COMMODORE GALLAGHER AND CHRIS MEYERS.

The American Gypsum Company, New Bank of Commerce Building, St. Louis, has purchased the plaster bluff on the Little Missouri River eleven miles from Nashville, and will erect a $100,000.00 plaster mill.

In order to block the carrying out of the sale of the Newark plant of the Stone Age Plaster Co., to Clarence P. Browning, a New York engraver, petitions have been filed in the New Jersey court of chancery in behalf of John A. Qualey, Mrs. Ellen Dunlop Hopkins and others interested.

The contract for the construction of the Poplar Grove street bridge, Baltimore, has been awarded to the Raymond Concrete Pile Company of New York and Chicago. The bridge will be of the plate girder type covered with concrete, with reinforced concrete floors. It will be 84' long, 66' wide, and will span the right of way of the Western Maryland R. R. A. E. Christhilf, chief engineer, Street Opening Commission.

The Thorn Column Company of New York has been organized to manufacture and sell steel, iron, marble and stone of all kinds; manufacture concrete materials, etc.; capital, $5,000.00. Incorporators, Geo. F. Thorn, No. 515 W. 111th street; James Farrar, Agnes Breiterman, both of No. 149 Broadway, all of New York City.

Articles of incorporation have been filed in St. Louis as follows: Tower and Mixer Manufacturing Company, capital, one-half paid, $200,000.00. Incorporators, Breckenridge Morehead, O. H. Shroyer, George D. Casnar and R. L. Gurney, each one share common stock and one share preferred; George D. Parish, to manufacture and deal in concrete construction appliances.

Among the new incorporations is that of the Tower & Mixer Manufacturing Company, of St. Louis, capitalized at $200,000.00, one-half paid. The incorporators are Breckenridge Morehead, O. H. Shreyer, Geo. D. Casner and others. The company will engage in the manufacture and deal in concrete construction appliances.

Em. Eichel, president of the Eichel Lime and Stone Company, was in Chicago this month.

The Boardwalk Committee of Council at Atlantic City, N. J., contemplate the paving of several blocks of the famous promenade with concrete laid upon expanded metal to test the wearing qualities in comparison with planking.

DETROIT CONCRETE NEWS.

Detroit, Mich., Sept. 19.—Reinforced concrete has entered principally into the construction of motor car factories in Detroit. During the past summer this industry of which Detroit is the hub, has been much criticized, but the fact that different Detroit plants are preparing to build additions or increase their capital stock should prove sufficient to ease the general mind regarding the stability of this branch of trade. The Hudson Motor Car Company, a concern formed about a year ago with a limited capital, has practically completed the construction of an entensive factory in the eastern part of the city. This company, a few days ago, increased its capitalization from $100,000 to $1,000,000.

There are many automobile factories which are decided models of up-to-date construction in reinforced concrete, and in Detroit proper the Packard Motor Car Company, the Chalmers Motor Company, the Ford Motor Company, the Lozier Motor Company, the Cadillac Motor Car Company, the Hudson Motor Car Company, the Grabowsky Power Wagon Company and the Alden-Sampson Company are samples. Perhaps as representative a plant as could be found from this number of excellent instances is that of the Ford Motor Company—a new series of offices and factory buildings in North Detroit.

PLASTER PLANT ENLARGED.

Quanah, Tex., Sept. 15.—Work on completing the enlargement of the plant of the American Cement Plaster Company's plant here is finished. The new work was done in strictly first-class shape, the addition being constructed of steel and sheet iron. The capacity is increased to 500 barrels per day. The cost of the additions will be about $40,000.00.

NEW CONCRETE CROSS TIE.

The American Concrete & Steel R. R. Tie Co., of Birmingham, Ala., has received an order from the Terminal Railroad Association of St. Louis for a section of their concrete ties to be placed under the track in the yards at St. Louis. As all the railroads entering St. Louis use the terminal tracks, this will be a test for all the roads entering that city.

E. M. Bullard, president of the company, has just returned from a trip through the west where he went in the interest of his company, and reports that the railroad officials he met were very much interested in the tie.

A section of these ties was placed several weeks ago under the rails of the main line of the Alabama Great Southern Railroad in their yard between Twentieth and Twenty-first streets, where they have been passed over by the passenger and freight trains of this company, and according to statements from officials of the road have measured up to every requirement.

This tie overcomes the objection heretofore raised as it possesses the elasticity required. It is made in two sections, being disjoined in the middle, thus giving them elasticity. A cross section extends out on each side, slightly beveled from center bearing to each end of this cross section, which allows the rail the necessary spring. A steel bar, countersunk, is placed on top of the tie sections which join the rail, extending under the rail, and clamped on the outside of rail, while a steel clamp on the inside of the rail resting against a boss on the steel bar, and inside of the rail, is secured to the cement tie by a bolt running through the tie. This arrangement makes it imposible for the rails to spread or turn over.

There is no question about this practicability of the invention, as it has been given the severest test possible. As a result of the test, railroad men are enthusiastic. The problem of securing a cross tie to substitute wood has long been a subject of deep concern to all railroads. The life of the present wood tie is from five to seven years, while that of the concrete tie is practically indefinite. Another advantage of this tie is the fact that it takes the place of two wood ties, thus reducing the cost, bringing the cost slightly more than the wood tie.

The company proposes to build a chain of plants throughout the country, to manufacture these ties, which will be located accessible to sand, gravel and cement. A 200 ton hydraulic machine will be used in their manufacture, which has a capacity of a complete tie every three minutes.

D. Grant & Co., Faribault, Minn., are making arrangements to establish one of the largest cement plants in the country at the mouth of the Yellowstone park, where the company owns a vast deposit of practically pure limestone and a deposit of clay. A tract of 600 acres of land has been purchased for the plant and equipping yards and trackage, which the Northern Pacific road is now building. Samuel Grant, a member of the firm, has just returned from Chicago, where he has purchased machinery for the plant.

J. C. Fredell and L. Torno have developed a magnesite exterior paint for the application to concrete surfaces which is something new and seems to have very high class as a waterproofing and makes a beautiful appearance. They have taken offices at 1120 First National Bank Building, Chicago, and expect to have their product ready for the market in a very short time.

W. W. Fischer, of the Fischer Lime and Cement Company, Memphis, Tenn., writes that his company is erecting a new warehouse structure 80'x300', the material used being reinforced concrete throughout. Mr. Fischer also passes a compliment to ROCK PRODUCTS when, in speaking of the series of cost system articles which appear in this paper, he says: "Your work in this line is to be much commended and, we feel sure, will lead to a more careful consideration of this most important part of our business by a great many dealers who have heretofore overlooked the same."

The Raymond Concrete Pile Company of New York and Chicago, has been awarded the contract for the Raymond concrete piles and foundations for a large warehouse for the Nielson Investment Company, St. Louis, Mo., Baker & Knell, architects. They have been awarded a contract for placing Raymond concrete piles in the foundations of the chapel to be built at the main entrance to Greenwood Cemetery, Brooklyn, N. Y., Warren & Wetmore, architects.

CLEVELAND CONSTRUCTION.

Cleveland, O., Sept. 19.—Architect George H. Steffens, architect in the Williamson building, has received commissions during the past month to erect two big buildings on Euclid avenue. One is an eight-story addition to the New Amsterdam apartment hotel and will cost about $80,000 completed. On the ground floor will be a large automobile salesroom with apartments above joined with the hotel corridors. The Dutch style of architecture is to be followed. The annex is being built for the Williamson Company, which owns the hotel. The other structure is a twelve-suite apartment house which Mr. Steffens is to build for George R. Canfield, who has leased a tract of ground in an exclusive section of Euclid avenue, where he will build the first apartment house to invade that particular section. It will cost about $60,000 and will be of reinforced concrete and brick throughout. It is planned to make it one of the most exclusive apartments along the avenue.

MISSOURI UNIVERSITY TO TEST CONCRETE.

Charles F. Curry has been appointed research assistant in the engineering department of the experimental station of the Missouri University. The new research assistant will experiment with the uses of concrete in addition to overseeing the experimental work of the students.

Concrete is now recognized as a very important building material. Its action under Missouri climatic conditions and the best formulas for use under these conditions are none too fully understood, and it is the purpose of the university to publish the results of Mr. Curry's experiments. Such data will be of great interest to contractors and builders, since it will come from practical experimental work conducted by a competent engineer.

The Roman Artificial Stone & Tile Co. has been organized at Sanford, Me., to deal in Portland cement, plaster, concrete, etc. Capital, $250,000.00. The incorporators are: President, Samuel Clark, Kennebunk, Me.; treasurer, William P. Hughes, Salem, Mass.; clerk, Fred I. Allen, Portland, Me.

Capital City Concrete Construction Company, Springfield, Ill., capital $40,000.00. Foreign corporation admitted to Kansas.

The Arlington Cement Tile Company, Arlington, O., has been incorporated with a capital stock of $6,000.00. William Rinehart, George Kimmell, G. W. Myers and P. J. Dillman were the incorporators.

The El Paso Tile Company, of El Paso, Texas, has been organized with a capital stock of $40,000.00. The incorporators are F. E. Hunter, W. Cooley and P. W. Pittman.

The Worthington Concrete and Tile Co., Worthington, Kan., has filed notice of an increase in capital stock from $15,000.00 to $25,000.00.

The Wichita Cement Brick and Supply Company, Wichita, Kan., has been incorporated with a capital stock of $25,000.00. Incorporators, John Tracy, Miller Dobbin, J. C. Pierson, J. H. Peairs, George Pierson, R. E. Miller, G. E. Meeker, M. E. Wright, all of Wichita.

A cement block factory is being built by the Luverne, Minn., Concrete Company.

A concrete tile and post manufacturing company has been organized in Glidden, Iowa, with a capital stock of $10,000.00. The officers of the company are: George Sherer, president; John F. Snyder, vice president; J. C. Riedesel, secretary; J. Coder, treasurer; B. G. Sherer, manager. Machinery will be installed at once, and the promoters expect to have the plant in operation within thirty days. Cement tile, posts and building block are provided for to start with. The promoters are enthusiastic in the hope of a fine patronage.

H. D. Jenkins, one of the Sandusky Portland Cement Company's star salesmen, stopped over in Chicago for a few days on his return to Detroit, Mich., where he makes his headquarters. He reports business as flourishing and is positive that the fall and winter trade will be fully up to expectations.

The Illinois Copeland Portable Wall Company, Chicago, has been organized; capital, $50,000.00, to manufacture Copeland portable cement process for walls and floors. Incorporators, Joseph Scheuer, George K. Schmidt, Joseph Kugel.

A TEXAS CONCRETE FIRM.

Potter & Potter, Amarillo, Texas, write as follows:

"Our business hasn't been as good this year as the average, owing to the fact there have been less residences built, and our block business is best when there are lots of residences going up. Concrete blocks are used almost exclusively here for foundations.

"Our cement, sand, gravel and crushed rock business has been good, as there has been a great deal of sidewalk work done and a number of large foundations for business houses have been put in where we furnished the materials. There is still other work of this kind coming up here, and we are expecting our business to resume its normal condition soon.

"We have a Coltrin mixer which drops the concrete where two downface block machines are. One good man can shovel concrete into both of them, a man at each machine to tamp, and two men to take the blocks away is about the most economical system of work we have yet found. Our blocks are dried in the house, and we keep them damp for seven to ten days. The face of the block is made of two parts sand to one of cement, while the backs are one to five. We find these proportions make a block that is very good and is giving satisfaction."

ALLOTMENT OF SPACE.

The first general allotment of exhibition space at the New York Cement Show, December 14-20, 1910, and the Chicago Cement Show, February 17-23, 1911, was made on September 2.

Practically all of the main floor space in Madison Square Garden and the Coliseum was taken at the first allotment. While the two buildings afford more than twice the amount of space which was available at the Coliseum for the Cement Show last year, there were enough applications for space to nearly fill both buildings. Only a few good locations remain at this time.

CONCRETE COAST DEFENSES.

Recent tests at Sandy Hook of the resisting power of reinforced concrete as a defense against high-powered projectiles confirm the calculations of the penetrating power of the twelve-inch gun. A concrete wall twenty feet thick, heavily reinforced with steel beams, was pierced by a twelve-inch projectile fired at high velocity. The blow delivered was sufficient to penetrate twenty-two inches of armor plate, and the reinforced concrete withstood the attacks so well that it will probably be used in the construction of the new coast defense fortifications in the Philippines. A similar attack is to be made with the fourteen-inch gun.—[Washington Star.

A. G. Van Schaick and E. L. Catlin, of Rome, N. Y., have received a patent for the improvement of concrete block making machines.

The Slater Construction Company, Pontiac, Mich., has just purchased about 2½ acres in Oak Park subdivision, north of Caniff road in Detroit. The company, which manufactures concrete blocks, will move its plant from Pontiac to the newly acquired Detroit property and operate in that city. The concern is already moving a portion of its equipment to the site and will begin the erection of a factory immediately. It is said that contracts have been secured for the manufacture of cement blocks for over 100 cellars, and it is anticipated there will be an increasing demand for this material.

The Standard Oil Company is doing a considerable amount of concrete work on buildings at their pumping station at Hays Grove, Pa., along the P. and R. railroad. Edward L. Faber, Carlisle, is in charge of the work.

The Raymond Concrete Pile Company of New York and Chicago, has opened an office at Portland, Ore., Room 626, Worcester Building. This office will be in charge of Gordon B. Raymond, who will give prompt and proper attention to all inquiries regarding concrete piling, permanent docks, bulkheads and work of a similar nature. The placing of the concrete piles and foundations of the Oregon Railroad & Navigation Company's freight house at Portland, the contract for which was recently awarded to the Raymond company, is now under way.

The Witthcefft-Krusz Concrete Forms and Construction Company, St. Louis, has been organized with capital stock $100,000.00. Incorporators Philip Krusz, Otto Schultes, Wm. Grond.

QUARRIES

The Wheeling Limestone Company, recently organized at Wheeling, W. Va., is about to install rock crushing machinery designed for a daily output of from 500 to 600 tons of material.

The Biggsville Crushed Stone Company, Oquawka, Ill., began operations recently. It has a capacity of ten carloads of crushed stone a day, and has a number of orders on hand for its product.

Rust, Swift & Company, of St. Louis, have secured the contract on improvement of the up-river from Clarksville to Illinois River. Their bid for rock was $1.55 per cubic yard and amounts to $40,000, including brush.

Capt. A. V. Fetter, of Quincy, Ill., has secured the contract for the up-river improvement between Keokuk, Ia., and Hannibal, Mo. His bid for rock is $1.68 per cubic yard and amounts to $45,000.00, including brush.

The appropriation of $20,000.00 for the improvements of the roads on the government reserve at Fort Niagara at the last session of Congress has now become available, and Lieut. E. H. Wagner, construction quartermaster of the 69th regiment of U. S. infantry, is preparing to proceed with the work.

The American Tripoli Company have in course of construction at their quarry north of Seneca, Mo., five additional drying sheds, doubling their former capacity. The company is one of the largest businesses of that section, being capitalized at $100,000.00, fully paid up. Their product, which is manufactured into flour for polishing purposes and water filters, is shipped all over the world. Robert Ornduff is the secretary and treasurer of the company and active resident manager, the other officers being located at Carthage.

Mayor Humes, of Joplin, Mo., seeks to improve the condition of the city streets and is having a mixture of lime dust and flint tailings placed upon some of them by way of experiment. After the roadbed becomes thoroughly compact, the surface is thinly coated with crude oil. Most of the roads of Jasper County are constructed of chat from the mines, and their condition is superior to the dirt roadways of the adjoining counties. Flint chat, however, in itself will not make a compact roadway, as the chat has a tendency to work loose.

The Daily Picayune, of New Orleans, La., in referring to the paving progress of that city during the past twelve months, says:

"During the past year, from last September, the city has made very good progress in street paving. There have been completed 29 streets, or 111,375 linear feet, amounting to 21.09 miles, 295,488 square yards.

"The cost of the city's part of this paving was $1,081,481.64, and that of the property owners and railway company $534,552.79, and the total cost was $1,616,034.39. Streets under contract and not completed amount to $1,077,395.85, making a total of $2,693,430.83."

HOOK & FORD SUFFER LOSS.

Baltimore, Md., Sept. 15.—The plant and bridge of the Hook & Ford Construction Co., located at their quarry at Hillsdale were destroyed by fire on the evening of September 10th, with a loss of about $50,000.00, partially covered by insurance.

The burned buildings were the boiler house, crushing house, containing two stone crushers, eight large bins filled with crushed stone, blacksmith shop and a number of sheds.

The Hook & Ford Construction Co. have offices at 811 Equitable Building, in this city.

E. M. Newby, P. O. Box 483, Norfolk, Va., wants prices on a second-hand No. 3 crusher.

E. C. Glendhill, Galion, O., has completed the erection of a stone crushing and gravel screening plant near Galion.

The Capitol Stone Company, Columbus, O., recently organized, is producing stone for ballast, concrete work, and road making. Their crusher has a capacity of 800 tons per day. C. V. Trott, formerly of Mt. Vernon, is secretary and treasurer of the company.

INTERNATIONAL ROAD CONGRESS.

The second International Road Congress met in Brussels, Belgium, in a seven days' session, July 31 to August 7. A resolution was adopted fixing 1913 as the year of the next congress, the date and place to be selected. Many interesting papers were read and discussions carried on throughout the sessions.

The conclusions adopted were all accepted without objection except that the third paragraph of the conclusion on the seventh question was modified somewhat. The conclusions of the congress were adopted as follows:

First Question.

I. Use of binding materials in the construction of metaled roads:

The Congress believes that it is desirable to pursue and develop the applications of the use of binding materials in the construction of metaled roadways, special attention being given:

1. To determine, in each case, the character of the binder best suited to local conditions;
2. To determine as exactly as possible the physical and chemical characteristics to be specified for tar, bituminous, asphaltic or other binders as best suited;
3. To compare the different results obtained in various methods of construction;
4. To investigate the influence that storing of tarred metal, during a more or less extended period, before being used, may have upon the perfection of the work;
5. To make a study of the deteriorations that the materials are subjected to during use;
6. To specify the system to be advised, where ordinary metaling has proved deficient and stone paving cannot for some reason be applied;
7. To establish for each district according to local conditions, and in each case the relation between cost and the result obtained.

II. Use of trackways in paved roads:

(a) Apart from exceptional cases depending upon local conditions, the construction of trackways in paved roadways can be considered but an expedient.

III. Progress made in combating wear and dust:

Confirming the resolutions passed at the Congress held in Paris in 1908, in further reference to the first conclusion just adopted and which is of interest, not only from the point of view of combating wear and dust but from that of binding the materials in metaled roads;

The Congress believes:

1. That superficial tarring may be considered as definitely accepted in practice and that the advantage to be derived from spreading fine sand or suitable stony material after tarring and rolling the same is not at present proved and should form the object of comparative tests;
2. That in the future applications of these methods the attention of road builders may be drawn with benefit to the comparison of results obtained by the laying of tar, bituminous or asphaltic substances hot or cold, by machine or by hand, both from the point of view of cost and from the point of view of the efficiency of the operation;
3. That it is desirable, in comparing results, to take into account the quality of the materials composing the metaling, the intensity of traffic and tonnage as well as the climate;
4. That, with due regard to the resources of each region in tar, bituminous or asphaltic substances, it is important to specify in contracts the conditions that are to be fulfilled, especially as regards the preservation of "life," that is to say, the property of preserving their binding power.
5. That it would be desirable that a comparison be established between the advantages of tarring—this word being taken in its broadest sense—in different cases; whether the operations are to be frequently repeated, small doses being applied each time, or whether larger quantities are to be applied at greater intervals. Furthermore, whether, in the metaling itself, a tar, bituminous or asphaltic binding material has already been incorporated or not;
6. That the conclusion adopted by the first Congress is to be maintained "in toto" running as follows: Emulsions of tar or of oil, hydroscopic salts, etc., have a real but not a lasting efficiency. Therefore their use should be limited to special constructions, such as race courses, festivals, processions, etc.

Second Question.

I. The formation and construction of foundations of roadways should be made the stronger in proportion to the lesser compactness of the ground. The foundations should have more body and resistance the more it is exposed to internal deterioration and external wear.

II. In the choice of the system of foundations for roadways, both stone set and metaled, stress should be laid principally on the degree of dryness of the subsoils, while having regard to the possibility of their drainage and to their geological nature, and to the nature of the materials of the locality. In order to determine the thickness and the extent of foundations, the pressure per unit area should be made compatible with the bearing power of the soil, observed under the most unfavorable conditions.

III. In soils where preliminary drainage is required before the construction the general methods of drainage should be applied to the whole or to a part of the road body and to the bed of the metal if necessary.

IV. The cross and longitudinal sections of roads and those of side gutters should be established so as to facilitate the flow of the trickling water, and to prevent infiltration of water into road surfaces, which should be made as impermeable as possible. The evaporation of superficial dampness should be encouraged by every means.

V. The work for the foundation and for drainage should be carried out simply and economically and by using the materials of the country as far as possible.

Third Question.

I. In the study of the new roads to be constructed both in the neighborhood of large towns and in the open country, it may be useful to try (if it does not interfere with the general interests) to provide a sufficient road width for the construction of a light railway outside of the roadway.

The alignment, the gradients and the design of the cross section will, according to the requirements, be determined in such a manner as to preserve all the facilities and necessary safety for every kind of traffic.

It is desirable that the supplementary costs should be borne by the concession holder or the constructor of the light railway, as far as the part of the road reserved for the rail track is concerned.

II. The laying of sunken rails in metaled roadways always obstructs the road, and there results a marked increase in cost of the maintenance of the roads. It is desirable that this method should be avoided as much as possible.

The laying of rails for tramways adjacent to the paving in paved roads makes the repair of the paving very difficult. It is necessary to diminish that nuisance, as far as possible, by appropriate methods.

III. When the railway is placed by the side of the road it is preferable, where the width of the road permits, to construct it on a special track, inaccessible for wheel traffic, and superelevated in order to allow greater safety.

It is necessary, in all cases, to provide proper drainage.

If it is a case of metaled roadways, the concessionary or constructor of the railway should be obliged to construct on the outside border of the free roadside sufficient depots for materials for the repair of the road. The same obligation should be, in some cases, extended to paved roads.

IV. The removal of trees along roadsides should not be tolerated, except in extraordinary cases.

If the width between the tree rows is insufficient for the rail track and to maintain the recognized necessary width for ordinary wheel traffic, the track should be laid on the outside of the trees.

V. It is desirable that the concessionaries of light railways should be obliged to maintain the area of the road or roadway occupied by the rails or contiguous to same, or pay the costs of this maintenance.

Fourth Question.

Throwing refuse upon the public roads should be carefully avoided. Such refuse should be swept and removed by the municipality and not by the owners of adjoining property, provided the cost of this work is recovered from the latter by taxation.

In large towns it is necessary to give special care to cleaning and watering.

Cleaning should be done as rapidly as possible.

Watering must be frequent, and its amount limited and dependent on local conditions.

Washing and sweeping are to be done as early as possible. Mechanical processes are particularly recommended.

Improvements in the implements are to be sought for with a view of insuring the most complete cleaning with the least inconvenience to the public.

Motor machines may be advantageously used for cleaning and watering roads in large towns.

Fifth Question.

1. Macadam built according to the methods of Tresaguet and McAdam causes dust and mud, is expensive to maintain, and suitable in large cities only for streets where the traffic is not very great or heavy.
2. The experimental work carried out in recent years with macadam improved by using a bituminous or tarry coating or binder must be continued in order to determine the best methods of utilizing this kind of construction under varying conditions, so that this question may be submitted again at the forthcoming conference.
3. Stone pavement has great qualities of resistance and durability. Its maintenance is easy and economical; it produces hardly any dust, and is suitable where there are tramway tracks.
4. It should be adopted in thoroughfares whenever noise is of little consequence, or when wood or asphalt surfaces are not suitable. It should consist of sets regular in shape, durable but not slippery, wearing evenly, laid upon a foundation and with close joints.
5. The Congress expresses the wish to see the trials of small set pavements continued wherever local circumstances and traffic conditions permit.
6. Wood paving is noiseless, not slippery if kept clean; it should be extended even to thoroughfares through which run tramway lines.
7. The respective advantages of soft and hard wood blocks must be a subject of discussion at a forthcoming congress.
8. Asphalt pavements should be recommended owing to their good qualities from the hygienic point of view, their ease of cleaning and of repair, and owing to the small tractive effort required on them. This surfacing is almost noiseless and produces but little dust, but it is unsatisfactory adjacent to tramway rails.
9. There is opportunity for its use in fashionable thoroughfares where the traffic is not severe, where there are no tramways, and where the grades are very moderate.
10. Finally, the trials of asphalt block pavements, whose qualities are not yet determined, should be continued.

Sixth Question.

1. It is desirable to free as far as possible the carriage ways from the minor distribution systems which now encumber them and to leave in them only the large sewers and mains which require little attention.
2. As far as possible the minor distributions which are connected with the adjoining houses should be doubled and placed on both sides of the street. This doubling is especially recommended for streets with heavy traffic and also for those where the surface rests on a solid foundation.
3. It is advisable to consider the advantages of placing all distribution systems, except gas, in subways of suitable dimensions placed under the footways. In this case great care must be taken to prevent flooding caused by the breakage of water pipes.
4. When the distribution works have been actually placed under the carriage way, the Congress advises that the system of doubling should be applied prudently by taking advantage of the opportunities given by considerable repairs or alterations.
5. Complete agreement is necessary between all authorities interested in the streets, in order to conduct their operations so as to interfere as little as possible with the traffic. It is most desirable that all street works should be under the general direction of those responsible for maintaining the surface.

The work must be carried out as rapidly as possible and so as to reduce the space occupied on the public highways and the obstruction to traffic.

6. Trees planted in the footways in urban districts should be chosen so as not to inconvenience the abutters

by their leaves nor to interfere by their roots with the distribution systems.

Seventh Question.

1. The development of mechanical traffic has not, up to the present, had the effect of increasing the weight of vehicles generally, beyond the limits recognized by regulations and custom in connection with constructional calculations.

In any case it is desirable that when existing regulations are revised, steps should be taken to test bridges by placing upon them the heaviest probable loads under the most unfavorable conditions and composed exclusively of mechanical vehicles.

2. Under the present conditions of constructing motor vehicles and building public roads it does not seem possible that the speed of vehicles could have any effect on modern and well built bridges which have not already been duly taken into account in the usually adopted methods of calculations of strength.

It may be advisable, however, when testing new or existing bridges to make use of the heaviest motor driven vehicles permitted to run and running over them at high speed.

3. The reinforcing of the different parts of which bridges are composed may aid their capacity to withstand the effects of vehicular traffic.

Eighth Question.

A.—With regard to animal drawn vehicles.

1. Heavily loaded vehicles with narrow tires may cause exceptional damage to roads laid down for ordinary traffic.

2. It is desirable that trials be made for the purpose of determining the relation which should exist between the load, the diameter of wheel and the width of tread, so as to avoid abnormal damage.

B.—With regard to mechanically driven vehicles.

1. Such automobiles as fall under the head of "touring cars" cannot cause abnormal damage to the roads so long as their speed is kept within limits.

2. Public service automobiles cannot cause appreciable damage to the road provided that the maximum speed does not exceed 25 kilometers per hour; the maximum axle load does not reach 4 tons on the heaviest loaded axle and that with wheels of 1 meter diameter the weight does not exceed 150 kg. per centimeter width of tread.

3. Industrial automobiles need not cause exceptional damage to a well constructed road provided that the following limits are adhered to:

First Type—Vehicles in which the axle load is less than 4½ tons; maximum speed, 20 kilom. per hour.

Load on Tires—150 kilog. per cm. of width of tread with wheels of 1 meter in diameter.

In the narrow streets in towns and large cities when vibrations of the ground are to be feared it is possible to minimize the inconvenience by reducing the speed in a suitable proportion.

Second Type—Vehicles in which the maximum axle loads are between 4½ and 7 tons.

Maximum speed: 12 kilom. per hour.

Load on tires: 150 kilog. per cm. of width of tread with wheels of 1 meter diameter.

Provisionally and unless changed by the results of further experiments: Where the diameter of the wheels is above 1 meter, the load per cm. width of tread, should be calculated for both types of vehicles and also for such as are described in Par. 2, by using the formula

$$C = 150 \sqrt{d}$$

where d = diameter in meters and C = the load in kilograms.

It is desirable that experiments should be undertaken to determine the maximum width which can be given to the tires of all automobiles while still insuring that, under normal conditions the distribution of the load on the ground should take place over the whole supporting area.

4. Ribbed or grooved iron tires cause abnormal damage to the road, no matter what their width or what load they support.

5. Vehicles propelled by mechanical power cannot cause extraordinary damage to the curved portions of roads provided that at these points a sufficient superelevation is given and that the curved portion is not approached or traversed at an unreasonable speed.

6. With a view to saving the roads it is desirable that the car builders go carefully into the question of clutches and brakes so that the skidding of the wheels may be avoided; that they also balance the motors as perfectly as possible, and that they allow a reasonable rising of the center of gravity.

Ninth Question.

The congress is of the opinion that public motor omnibus service should be encouraged.

The congress is of the opinion that it is difficult at the present moment to decide definitely on the respective advantages of the two modes of transportation, but that one forms the complement of the other and not the rival.

The progress of motor omnibus transportation and extent of the use of this method of transportation is capable of great extension.

(a) By the use of wheels fitted with rubber tires.

(b) By any progress made in construction.

The carrying capacity of motor omnibuses should be different for the town than for the country.

When the reading and voting on the conclusions had been completed, the president announced that the next congress would be held in 1913, the date and place to be fixed by the permanent association. He thanked the delegates for their uniform interest and courtesy, and invited remarks.

Among those who responded in English were Mr. W. W. Crosby, of the United States, and Mr. Percy Boulnois, of Great Britain. Mr. Crosby spoke as follows:

In the absence of the chairman of the delegation from the United States of America, I have the honor to speak for the delegation. To fully express our appreciation of the courtesies and kindnesses we have met on every hand is beyond my powers, but, in the name of the United States delegation, I wish to tender to his majesty, the king, to the president of the congress and to the officials and members generally, our sincere thanks. We feel that this congress has made a great advance in the work of the association and that much good will result from it. We have been greatly interested in all the proceedings of the congress. We see its close and take our departure with regret. We shall, however, say "Au revoir" and not "Adieu" in the hope of the future and we most earnestly hope that at no distant date, we in the United States of America may be able to there return to you some, at least, of the many courtesies and kindnesses we have received.

The remarks of Mr. Boulnois follows:

"I regret that my colleague, Sir George Gibbs, was obliged to return to London. It is a great honor for me to take his place.

"I cannot say too much for the importance of these congresses. It is not only the reports and communications which are important, but the meeting here of eminent men for the discussions is of great advantage.

"The difficulty is in framing resolutions to suit all countries; in this case we have, I believe, succeeded.

"I express a hope that at some time a future congress will meet in London, and I congratulate the permanent bureau, the presidents, MM. Lethier and Lagasse de Locht; the general secretaries, MM. Mahieu and Walin, and I extend thanks in the name of my country to Belgium for the charming reception."

Amid applause the president general declared the congress officially closed.

Delegates from America.

Among the delegates from the United States who attended the congress were the following:

J. H. Cooke, Alabama; J. H. MacDonald, Connecticut; Col. Spencer Cosby, U. S. Army, Washington, D. C.; C. A. Kenyon, Indiana; W. W. Crosby, Maryland; C. W. Ames, Minnesota; E. L. Corthell, Nelson P. Lewis, E. L. Powers, Clifford Richardson, John M. Goodell and J. W. Jones, New York; H. L. Pillock and George F. Rogers, Oregon; Alexander P. Brown and Howard Longstreet, Pennsylvania; Col. J. C. Sanford and Arthur H. Blanchard, Rhode Island; Samuel Hill, Washington.

The Exhibition Feature.

The exhibition of materials and machinery for road purposes was given in the pavilion of Civil Engineering of the Universal Exhibition. There were exhibits from nine different nations: Germany, England, Belgium, France, Netherlands, Italy, Norway, Sweden and Switzerland.

Among those which attracted especial attention were the following:

Strassenwalzbetrieh vorm. of Germany exhibited tarring apparatus and scarifiers.

Barford & Parkins, engineers, of Petersborough, England, exhibited motor rollers and photographs.

Societe Anomye de Cylindrage des Routes, Ixelles, Belgium, exhibited a steam roller, draining pumps, a gasoline roller, an automobile sweeper and other apparatus.

Valeke Brothers, engineers, of Ostend, exhibited an Aveling & Porter steam roller, a steam tractor, etc.

Robert Houben, manufacturer of chemical products, Brussels, exhibited tar powder and dust laying concrete.

J. B. Ailot, contractor of Monceau-les-Mines, France, exhibited rollers.

Lassailly, administration director of the Societe Generale de Goudronnage des Routes, Issy-les-Moulineaux, France, exhibited drawings and photographs of road tarring machines, specimens of tarred roads and pitch macadam.

J. Voisembert and P. Hedeline, of Paris, France, exhibited a road tarring machine.

Arthur Metz, of Paris, France, exhibited applications of reinforced asphalt, flagstone paving, etc.

The Society for the Construction and Maintenance of streets of Turin, Italy, with Engineers Goll and Conelli in charge, exhibited sweeping machines, drawings, etc.

Department of Public Works of Geneva, Switzerland, exhibited maps of mountain roads, etc.

During the congress the delegates and members were admitted to the special road exhibition and also to the universal exposition without charge.

DENVER'S MUNICIPAL ASPHALT PLANT.

On August 1 Denver's municipal asphalt plant commenced operations. Henceforward all asphalt mixture used by the city in the repair and resurfacing of the paved streets will be manufactured at this plant.

In some of the eastern cities there are plants of this order which not only supply material for the original paving but also supply many private contracts. Until the practicability of the new feature has been demonstrated the production will be limited to the one object of supplying material for repairs and resurfacing.

The approximate cost to date of the plant is $25,000.00. The supervision of the plant is in the hands of S. R. Murray, who also supervised the construction of the plant. Mr. Murray was superintendent of the Indianapolis factory for two years and has been interested in the asphalt business for seventeen years.

The plant itself is considered by Mr. Murray to be the most modern and the best in regard to detail in the country. It is estimated that it will more than pay for itself in two years.

The buildings are of steel and concrete and strictly fireproof. The capacity at the present time is 1,000 square yards of two-inch surfacing per day. The location of the plant is within easy access of an almost unlimited supply of sand.

Lime dust and Portland cement are the chief ingredients of the filler. The finished product is rated at 99 per cent pure asphalt bitumen.

BIRMINGHAM NEWS.

Birmingham, Ala., Sept. 20.—This month has witnessed an unusual amount of activity as far as the use of crushed stone is concerned. The paving companies have about completed their old jobs and now are bidding for the many new ones offered both by city and county. The county board of revenue recently awarded contracts amounting to $12,040.00 for the construction of seven new roads. Work on them will begin as soon as possible. The contracts were let as follows: Johns and county line road to E. D. Wright for $4,273.00; Lewisburg and Walker's Chapel road to T. J. Ellard for $1,022.00; Waterworks Hill road to A. F. Bearden for $1,486.00; Short Creek road to Parker & Co. for $865.00; Brookside and Mineral Springs road to Wade and Bedford for $2,041.00; Shades Mountain and Cool's Ford road to H. W. Parker for $1,868.00.

A new macadam road between Wylam and Mulaga is also being constructed by the board of revenue, and is nearing completion. Mr. Haigler, of the board, had the following to say regarding the improvement of roads: "We would like to see every important road in Jefferson County macadamized. Although our fund is not very large, we are pairing from fifteen to twenty miles every year in addition to keeping up repairs on those that are already paved. In a few years Jefferson County will have the best system of roads in the South, I hope."

Bids for street construction to approximate $270,000.00 in cost were opened at a recent meeting of the street committee of the city council.

The Southern Bitulitic Co. has had a very busy month, being engaged for the most part in the completion of old work. Mr. Sullings, of the company, had the following to say: "While we have had nothing new, business is very good. A large amount of bitulitic work is soon to be let by the city and we expect a goodly share of it."

The Graves-Mathews Paving Co., of this city, reports a good month and expects a good share of new work as soon as the contracts are let.

A firm composed of A. W. Beeler, W. S. Duncan, and F. A. Maxwell is developing a stone crushing industry at Golden, Colo. The immense red granite ledges west of Golden are the source of supply, and there appears to be a good demand for the product in Denver.

CALIFORNIA QUARRIES.

San Francisco, Cal., Sept. 16.—Ericson & Peterson, railroad contractors, are doing a large amount of concrete tunnel work on the Southern Pacific Railroad's new line in northern California. They have been engaged in this work for the last two years, and have contracts which will require some four years more to complete, keeping about 2,700 men at work. They have just installed a new crushing plant of large capacity.

SPRINGFIELD QUARRY NEWS.

Springfield, Ill., Sept. 21.—S. A. Tuttle & Company, of Decatur, have received a contract to lay the Eldorado street paving in that city for $25,306.00.

The Inter-Ocean Paving Company, of Chicago, will pave Batavia avenue in Batavia, having received the contract for $24,875.00.

I. D. Lain, of Bloomington, was successful in the bids for paving Washington and Evans streets in that city. The work on the two thoroughfares will amount to $52,000.00.

The Wyckoff-St. John Quarry & Construction Company, of Alton, Ill., has been incorporated. Capital stock, $10,000.00. Incorporators: George E. Wycoff, Patrick St. John and Henry J. Talbot. The company will engage in quarrying and contracting.

Fire destroyed the rock crushing plant of P. J. Moran, located beyond Ninth North and Second West Streets, Salt Lake City, Utah, recently. The plant was adjacent to the lime and stone quarry of the Bamberger Quarry Company, and had been leased to Mr. Moran. The damage is estimated at $2,000.00.

NEW SOUTH DAKOTA MILL.

Plaster Concern With Good Natural Resources and Fine Equipment Begins the Manufacture of Hard Wall Plaster.

Rapid City, S. D., Sept. 20.—The Dakota Plaster Company, whose mill is located at Blackhawk, a short distance from here, has just begun operations and they are making a very high grade of wall plaster. They are located alongside of the Northwestern track and their new mill has recently been equipped with a full line of calcining and grinding, bagging and mining machinery, furnished by The J. B. Ehrsam & Sons Manufacturing Co., of Enterprise, Kan.

The different deposits from which the solvate rock is mined and quarried is located in a ledge high above the plant and the heavy material is brought to the plant by a system of gravity carriers, the calcining or burning of the materials in kettles is done with lignite coal, which comes from the extensive Wyoming beds. The machinery of the plant is driven by electric power which comes from Rapid City, and the lighting of the properties is also provided for by electric lights from the same source.

The company's properties consist of about 320 acres of land, which is practically all one gypsum deposit, forty acres of which have been opened up alongside of the mill. There are also large beds of gypsite on the same properties and in the same localities. Previous to installing this extensive plant the company had their material thoroughly tested and found that they can produce a fine plaster material.

The company, as organized, consists of the following prominent business men of this locality: Joseph Jay, president; B. L. Allender, vice-president; H. W. Heinrich, treasurer and Carl Winters, secretary and manager. They begin business under very favorable prospects and the goods which they furnish have met with the approval of the trade and they are already building up a valuable clientele.

LOUISVILLE PLASTER NEWS.

Louisville, Ky., Sept. 20.—Louisville has had a "run" on apartment houses this year, the records of the building inspector's office showing that permits have been taken out for the erection of a score or more, and the plaster men have gotten a large part of their business in connection with their erection. They are for the apartment house strong, and hope that they will continue to be erected in number.

All of the local plants are operating to their capacity. Some of the plaster men say that there used to be a good deal of price cutting locally, but good business has apparently made that unnecessary, for there is little complaint of anything of that kind now.

Both the Louisville and Jeffersonville mills of the Kentucky Wall Plaster Company are running, and as no stocks that are visible are piling up, it looks as if the company is selling about all it can make. It has put its new warehouse into use, and as it has railroad facilities a good deal of the shipping can be done from there. The company has handled some long distance jobs recently, having shipped as far as Cairo, Ill., and Mobile, Ala. E. J. Campbell, head of the company, was a member of the committee which had charge of Irish-American night at the State Fair.

The Atlas Wall Plaster Company reported the situation unusually good, with a heavy demand for plaster. The plant is running full time, and was recently improved by the addition of a new sand drier manufactured by the W. E. Caldwell Company, of Louisville. The Atlas delivered the plaster used in the big Park Avenue apartment house being completed by L. Keller & Son, and is finding the apartment house deal helping a lot.

The Southern Wall Plaster Company is doing a much better business than last month, and is running full time.

JOHN F. YOUNGER DIES.

Springfield, Ill., Sept. 21.—John F. Younger, thirty-one years old, manager for the United States Gypsum Company in this city, died August 31. He was popular among a wide circle of friends.

SUCCESSFUL CHICAGO ASSOCIATION.

Thirty years ago the first plasterers' organization in this country was formed in Chicago. It was organized under the name of The Employers Plasterers' Association of Chicago and it has operated under arbitration agreements the last fifteen years.

It was organized for the purpose of making wage agreements and working rules with the various mechanics who are employed by its members. This association has been under contract since 1900 with the journeymen plasterers, building and hod carriers' unions, and has maintained the most harmonious relations with these men since that time. The association has been singularly free from strikes under the terms of its joint arbitration agreement. This agreement is an innovation, in that it provides, among other things, that a sympathetic strike shall not be a violation of the agreement, provided the trade in whose interest a sympathetic strike is to be called shall offer and be refused arbitration of the matter in dispute or in effect, that no sympathetic strike shall be called unless the other side refuse arbitration.

This old organization has a membership of fifteen, with an associate membership of ninety. The Employers Plasterers' Association of Chicago has always exerted its influence for good work, for fair and equitable working conditions and for the upbuilding of the craft in general. It has a joint arbitration committee which is absolutely empowered to adjust all grievances. Its members do considerable work in other states, all of which is done under union conditions and in conformity with joint arbitration agreements.

The members of this association have recently entered into joint arbitration agreements with the White City District Council of the Wood, Wire and Metal Lathers International Union. The Employers Plasterers' Association, in conjunction with its affiliated trades, are at present endeavoring to incorporate in the new Chicago building code amendments that will raise the standard of lathing and plastering in this community, both from a fireproofing and a sanitary standpoint.

It is also a condition in all the agreements made by this organization that any one shall have the right to employ its affiliated craftsmen under precisely the same conditions as they themselves employ these men. The following are the present officers of the Employers Plasterers' Association of Chicago: Oscar A. Reum, president; John C. Sutton, secretary and treasurer; Thos. J. McNulty, vice-president. The members of the joint arbitration committee are: Oscar A. Reum, P. J. McNulty, R. S. Haldemann and Wm. Gavin.

REACHING NEW ENGLAND.

St. Louis, Mo., Sept. 19.—Sales Manager Steeg is getting to be a hard man to find, since he is becoming something of a traveler in paying visits to the various plants of the company. It goes without saying that there is always something doing in the offices of the Acme Cement Plaster Company. Buildings have to be plastered and big manufacturers of the hard wall kind of plaster are sure of getting a goodly share of the business.

Of course, if buildings must be plastered, the plaster must have something to stick to, and that is where the Acme woven lath comes in play. James H. Strother, sales manager of the company, states that they are making rapid progress in the introduction of their specialty. At present they are giving the New England field full attention, with very satisfactory results, having succeeded in interesting some of the large distributors of building material in their woven lath and through them in reaching the retail trade generally.

BUILDING NEW MILLS.

Rapid progress marks the construction of the mammoth new plaster mill of the United States Gypsum Company at Fort Dodge, Iowa. It will be completed some time this fall. It will be fireproof and the most complete and expensive calcining plaster mill in the world. This company, it is learned, will break ground for a still larger mill and even more expensive than the one nearing completion at Fort Dodge, next month.

Officials of the United States Gypsum Company state that the current year is proving to be a most satisfactory one in this business. Retrenchment and reduction in operations which have been characteristic of some prominent lines of manufacture have not taken place in this industry. It is stated earnings are showing substantial increases over last year.

W. N. Fox, of Palestine, Tex., has moved his concrete works to Bryan, Tex.

NO REASON FOR DISCRIMINATION.

It frequently happens that there are discriminations against materials on the part of engineering contractors and on the part of architects who do not do themselves the justice to examine the materials which they ruthlessly condemn. There is perhaps no line of human activity at the present time in which there is so much improvement as with all building materials. Yet we find that those who consider themselves the leaders in these respective lines do not hesitate to condemn the modern improvements in structural materials without even giving the matter a passing consideration.

The sand lime brick has taken its place amongst the building materials of this country and for many purposes it cannot be equalled by any other product obtainable. Since the standardization measures that were adopted by the American Association of Manufactures of Sand Lime Products has gone into operation, the importance of the brick is guaranteed to the user and the specifying architect as well as the engineering contractor need no longer hesitate to use the bricks under the guarantee of the manufacturers who make them by the standards of the American Association. No one who is an expert in this matter of bricks will hesitate for a moment to say that the sand lime bricks are all they should be when they come up to the standard specifications which were adopted with no little expenditure of money and effort to make them what they should be.

OPERATIONS IN BLACK HILLS.

Rapid City, S. D., Sept. 15.—The Black Hills Pressed Brick Company, of Rapid City, S. D., has closed down its plant after a very successful run of two months, for the purpose of making extensive improvements. This company is operating on fifty acres of its own land within the city limits of Rapid City, which is the busiest place in the Black Hills. They own their own sand, which is in rock formation, and red, white and buff in color. They are now putting in a gravity tramroad from the quarry to the crusher and rolls, which is over the wetpan which grinds the sand and mixes it with the lime. They get their hydrated lime from the Rapid City Lime and Gypsum Company, which is under the same management as the brick company.

F. H. Perry, the president of both companies, has put in a hydrating system of his own, which has worked very satisfactorily indeed. The brick company has two presses, one four-mold Berg and one twelve-mold Saginaw Rotary, with three cylinders. In this plant every device that will save labor has been thought of. Individual motors are being provided for each machine. This company has its own quarry of mineral paint, and is prepared to supply other sand-lime brick plants with this material, which is very suitable for chocolate brick. This company has a large territory to supply and has experienced a big demand for its product.

C. W. Todd, who for years past covered the Black Hills and surrounding territory for the Knapp-Spencer Hardware Company, of Sioux City, is sales manager for both companies, and F. H. Perry is general manager. The brick plant will be ready to resume operations in two weeks.

The Philadelphia Sand Lime Brick Company has been incorporated at Camden, N. J., to manufacture sand lime bricks. Capital stock, $100,000.00. Incorporators, F. R. Hansell, John A. MacPeak, I. C. Clow, all of Camden.

The Massachusetts Sand Lime Brick Company has been incorporated at Boston, Mass., with a capital stock of $50,000.00. Incorporators, president, Frank W. Blair, Brookline; treasurer, C. Mody Ryan; clerk, Charles P. King, both of Boston, all of Massachusetts.

PORTAGE SAND LIME BRICK.

Portage, Wis., Sept. 20.—The Columbia Silica Company have an up-to-date plant here and find a good demand for their sand-lime brick. There are many advantages which this company claims for its product. In colors they produce chocolate brown, lavender, buff, red, and gray, both dark and light.

CEMENT

THE CEMENT SITUATION.

With the opening of the fall season, the cement manufacturer finds the situation practically unchanged. The demand is every bit as good as it has been throughout the summer and the indications are that this condition will continue throughout the fall and early winter. Prices remain firm and there seems to be no danger of a cut as long as the demand keeps up as it has. A great many of the mills have been sold right up to capacity all along and have enough advance orders on their books to keep their mills running full time throughout the year. It can be truthfully stated that the conditions are much better than they were at this time last year, and with the increased amount of building and construction work of various kinds in which cement is playing a prominent part, there is every reason to believe that the year 1910 will go down into history as a fairly good one for the cement industry at large. Every day sees some new use to which cement is being put, and public

R. L. COPE, ALLENTOWN PORTLAND CEMENT COMPANY, ALLENTOWN, PA.

confidence is being strengthened by the remarkable successes which have attended the development of the industry. Despite the carping critics, cement continues to grow in favor with architects and contractors everywhere, and the future is indeed bright for the industry.

R. L. COPE MAKES A CHANGE.

One of the successful men in the operation of a cement business is the versatile employee who can fill in the other fellow's job, whether it be in the operating or selling end of the business.

One of these factors connected with the cement business is Robert L. Cope, who, back in 1903, first connected himself with the Bonneville Portland Cement Company, Philadelphia, Pa., as cashier. After getting a line on the book end of the business he changed and became cashier for the Alma Cement Company, at Wellston, Ohio. Later on he was advanced to assistant sales manager and, in 1909, he joined the forces of the Newcastle Portland Cement Company, Newcastle, Pa., leaving there in August of this year to become purchasing agent and assistant manager of the Allentown Portland Cement Company, Allentown, Pa.

"Bob Cope" is one of those affable fellows that makes a hit wherever he goes. He is popular with the dealer and is the chum of his competitor and he conducts himself so that the general manager of the institution believes in him. His new connection will give him greater opportunities. We predict even better things for this gentleman who has recently moved his headquarters from Newcastle to Allentown. He has our best wishes for his success.

COMMENCED OPERATIONS.

The Norfolk Portland Cement Corporation, incorporated under the laws of Virginia, has started operations at Norfolk, Va., adding another gigantic enterprise to those already established at that port. The parent company of the Norfolk Portland Cement Corporation is the American Cement Company. The plant of the Norfolk Portland Cement Corporation is located on the southern branch of the Elizabeth river, just above the navy yard on the opposite side.

PIEDMONT PORTLAND CEMENT CO.

The $400,000 plant of the Piedmont Portland Cement Company at Aragon, Polk county, Georgia, is rapidly nearing completion, and it is expected that the finished product will be turned out within the next sixty days. It is stated that the plant will have a capacity of 1,000 barrels a day and that this will be doubled in the course of a year. The officers of the company are J. C. Bass, of Carrollton, president, and W. H. Davis, of Atlanta, formerly of Dawson, secretary, treasurer and general manager. The main office will be in Atlanta and under the charge of Mr. Davis.

Announcement has been made that there was recently organized the Ajax Portland Cement Co. which has been incorporated in Albany with a capital of $250,000.00, and will have its principal offices in Newburgh, N. Y. The company will engage in the manufacture and sale of cement. The officers are John E. Sparrow, of Brooklyn, president; Geo. S. Schultz, of New York, vice president; Clarence L. Angell, of New York, secretary; Nathan Peck, of New York, treasurer; Robert G. Boyd, of Newburgh, assistant treasurer. The company will have its own special brand which will be known as the Rose-Portland Cement.

The Lumberman's Portland Cement Company, with its principal offices in Kansas City and a plant at Carlyle, Kan., has been placed in the hands of a receiver. The receiver is C. A. Apt of Iola, who has been attorney for the company. He is temporarily in charge while the company is seeking to work out a reorganization.

Arrangements have been perfected for the organization of a large Portland cement company at Rapid City, S. D., which will operate on extensive gypsum beds west of that city. The company is to be capitalized at $3,500,000.00. The company will control 1,180 acres one and one-half miles west of Rapid City, and engineers have started surveys and plans for the plant, which will have a capacity of 4,000 barrels daily.

C. E. Gittings, a director of the Nebraska Portland Cement Co., of Superior, Neb., has just returned from a directors' meeting held in Omaha, at which it was decided to authorize C. W. McLaughlin, the president, to at once begin work with the Burlington for track laying to the quarries, and to commence work on the plant buildings at once.

At the meeting of the stockholders of the Helderberg Cement Company, of Albany, N. Y., the following directors were elected: T. Henry Dumary, Anthony N. Brady, Robert T. Pruyn, Frederick W. Kelly, James C. Farrell, Thomas E. Murray, Edward L. Pruyn, Charles H. Ramsey, James B. McEwan, Howard Van Rensselaer, Nicholas T. Brady and Frederick Pruyn.

The Iola Portland Cement Company is to establish headquarters at Oklahoma City, Okla.

The Jamestown Portland Cement Company proposes to build a plant at Yorktown, Va., with a capacity of 1,250,000 barrels per annum. John F. Braun, of Philadelphia, of John F. Braun & Sons, manufacturers of lawn mowers, is secretary and treasurer of the new company, which will issue $2,040,000.00 capital stock.

ST. LOUIS CEMENT NEWS.

St. Louis, Mo., Sept. 19.—Sales Manager A. H. Craney, of the cement department of the Union Sand & Material Company, like many other men of large affairs, is a student of statistics, and on the occasion of the call of the representative of ROCK PRODUCTS proceeded to give him a few figures. Speaking of the production of cement in the state of Missouri, Mr. Craney said the grand total was 3,412,000 barrels, of a value of $2,808,916, produced by four plants. He finds the demand excellent, with prices unchanged, but firm. During August the production in the United States was increased 19 per cent over 1909, and the shipments show an increase of 10 per cent. The country is now taking very near the entire capacity of all the plants making reliable Portland cement. The decrease of stocks September 1, as compared with August 1, was very material, and was much larger than was the case a year ago. The increase in the shipments of the leading producing section was 20 per cent for August over the same month last year. Stocks on hand in the middle West are quite small and the shipments at the present time are exceptionally heavy.

The company has just installed at their Kansas City plant a 35-ton traction steam shovel, manufactured by the Ohio Steam Shovel & Dredge Company, of Cincinnati, Ohio. As compared with the old style steam shovel that very nearly required the space of a city block in which to turn around, Mr. Craney said this shovel was a great improvement upon it.

R. A. McKinnon, sales manager of the Continental Portland Cement Company, states that the demand for cement which set in in earnest last spring shows no sign of falling off.

Missouri ranks sixth among the states producing cement, and will in two years rank fourth if the

OHIO STEAM SHOVEL RECENTLY INSTALLED AT PLANT OF UNION SAND & MATERIAL COMPANY.

rate this industry is increasing in this state is maintained for that space of time. Two years ago Missouri had but two cement manufacturing plants, while now it has four, and these are of large capacity. In the near future the plant in Cape Girardeau County will be in operation, thus increasing the output of the state.

A regular monthly meeting of the board of directors of the Coplay Cement Manufacturing Company, of Coplay, Pa., was held at Coplay recently, at which time the directors received and accepted the resignation of President William H. Harding. I. W. Loeb, a Philadelphia financier, was elected to the presidency. It was also decided to move the general offices from Philadelphia to the works at Coplay.

The manufacturing plant and other property of the Bonner Portland Cement Company at Bonner Springs, Kan., which has been in the hands of Henry McGrew, federal receiver, for a year, is to be sold November 1. Judge John C. Pollock, of the federal court in Kansas City, Kan., has issued the order.

The Best Keene Cement Company, Medicine Lodge, Kan., are to establish a New York office.

Within a year the Hawkeye Cement Company, which owns a large tract of land in Mason City, Ia., and has mills in Des Moines and in different points in Kansas, will build a cement mill there, was the assertion of A. H. Rinne, a representative of the company, who was in Mason City recently.

After an idleness of nearly a year, the Penn-Allen cement plant at Penn-Allen, Pa., near Nazareth, has resumed, following the granting of a charter to the Penn-Allen Cement Company, which now owns the property formerly owned by the Penn-Allen Portland Cement Company.

Cement Statistics For the Year 1909

The Department of the Interior, United States Geological Survey, has issued the complete statistics on the cement industry for the year 1909. The statistics are valuable as documentary evidence showing the character, amount and value of the cement manufactured during the year and comparisons with previous years. The figures reported by the various manufacturers are accepted and used absolutely in the compilation of the report. Ernest F. Burchard had charge of the compilation of the report, excerpts from which follow:

The total quantity of Portland, natural and puzzolan cements produced in the United States during 1909 was 64,196,386 barrels, valued at $51,232,979. As compared with 1908, when the production was 52,910,925 barrels, valued at $44,477,653, the year 1909 showed an increase of 11,285,461 barrels, or 21.3 per cent, in quantity, and an increase of $6,755,326, or 15.1 per cent, in value. The increase in quantity is the largest ever recorded, but the failure of the increase in value to keep pace with the increase in production is significant of the trade conditions which the cement industry encountered during 1909.

The distribution of the total production among the three main classes of cement is shown in the following table. For comparison the figures for 1907 and 1908 are also presented.

Portland Cement Production.

The total production of Portland cement in the United States in 1909 as reported to the Geological Survey was 62,508,461 barrels, valued at $50,510,385. As compared with the production of 1908, which was 51,072,612 barrels, valued at $43,547,679, the output for 1909 represents an increase in quantity of 11,435,849 barrels, or 22.37 per cent, and an increase in value of $6,962,706, or 15.96 per cent.

The average price per barrel in 1909, according to the figures reported to the survey, was therefore a trifle less than 81 cents. This represents the value of the cement in bulk at the mills, including the labor cost of packing, but not the value of the sacks or barrels. This average price is 8 to 10 cents higher than the average price received for cement in the Lehigh district, and in the Eastern States as a whole, and is about 1 cent higher than the average for the Central States. It is only a fraction of 1 cent lower than the price reported from the Western States, 7 cents lower than the average price in the South, and 60 cents lower than the average price per barrel received at the Pacific coast plants. There are several reasons for this apparently high average for the whole country. Certain plants were able to command a price higher than the average, because practically their whole output was sold in nearby markets in which they had decidedly the advantage in freight rates. During the early part of the year prices were generally below the average, culminating in an extremely low level in the summer time. During this period many plants were shut down, or else operated under greatly reduced capacity. With revival of business in the fall, contracts were secured at prices which brought the average receipts for many such plants up to a point above the general average of those plants that did a large business on low margins throughout the year. Furthermore, the value of white Portland cement, which sells for a comparatively high price, is included in the general average, and also the values reported from the Pacific coast plants as well as the value of the cement manufactured by the plant of the United States Reclamation Service at Roosevelt, Ariz., all of which tends to increase the figure.

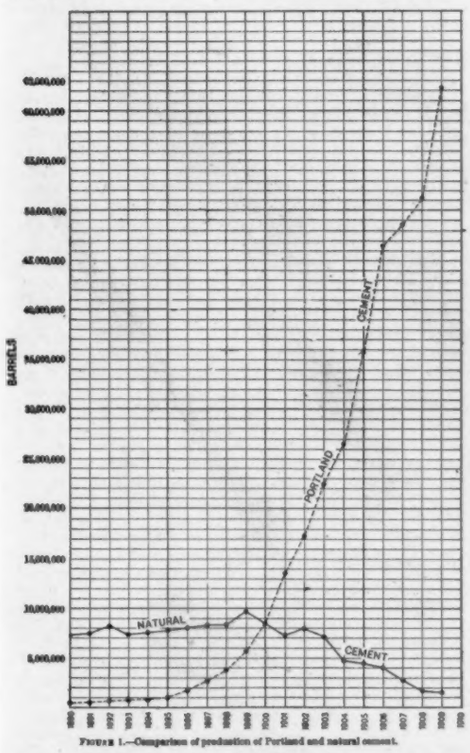


FIGURE 1.—Comparison of production of Portland and natural cement.

Production of the Lehigh District, 1890-1909.

The Lehigh district of Pennsylvania-New Jersey for the first time showed a decrease in production of Portland cement in 1908. In 1909 there was a substantial increase of 2,100,311 barrels, but the annual output did not quite reach that of 1906, and fell considerably short of the high level of 1907. The increase in production for 1909 over that of 1908 amounted to 10.39 per cent as compared with an increase of 22.37 per cent for the whole country. This relative decrease in output is also shown in the steadily decreasing percentage of the total production which is supplied by the Lehigh district. In 1899 this district produced nearly 73 per cent of the Portland cement manufactured in the United States; ten years later the proportion was only 35.7 per cent. In 1908, 17 plants reported production of Portland cement in the Lehigh district, and the average price per barrel as reported to the survey was 75 cents. In 1909, 19 plants reported production, with an average price of a trifle more than 70 cents per barrel.

Growth of the Portland Cement Industry, 1870-1909.

The growth of the industry for the years 1890 to 1909, inclusive, is illustrated graphically in figure 1. For comparison, the decline in the natural cement industry is plotted on the same diagram.

In another table statistics are given covering the annual production of Portland cement in the United States from the inception of the industry in the early seventies to the present day.

On examination of this table it will be seen that the industry showed a fair but not in any way remarkable rate of growth from its commencement in the seventies until 1895. At the latter date, however, a very striking development commenced, coincident, it may be noted, with the development of coal burning in the rotary kiln. This rapid rate of growth continued until 1907, when it was checked temporarily by the financial crisis of that year.

On examining the cement statistics for the series of years, it will be seen that the output of Portland cement has so far shown an increase each year, rising from 42,000 barrels in 1880 to 335,500 barrels in 1890, to 8,482,020 barrels in 1900, and to 62,508,461 barrels in 1909. The natural cement production, on the other hand, reached its maximum in 1899, with an output of 9,868,179 barrels. Since that year it has shown an almost continuous and rapid decrease annually, until now it has become a relatively unimportant factor in the cement situation.

Cement Prices, 1880-1909.

One of the most striking features connected with the Portland cement industry in this country has been the decline in cement prices during the last thirty years. This decline has, as a matter of fact, been as steady and as marked as the growth in annual output.

The decreases in the price of cement have been due to two factors. In the earlier years of the industry there were periodical decreases in cost of production, and in recent years the intense competition between manufacturers has been the main reducing influence. Eckel* has pointed out that the great decrease in costs came in three abrupt steps coincident with radical changes in the methods of manufacture. First, the general adoption of the rotary kiln was the cause of sharp reductions in manufacturing costs; a second fall in costs occurred when powdered coal became the standard fuel in the rotary kiln; and third, the adoption of long rotary kilns has shown a gain in output. Eckel also states that so long as there are no very radical changes in present methods of cement manufacture, no further marked decreases in operating costs can be expected; and since the manufacturing costs at well-conducted plants have in the last two years reached levels which can not be greatly lowered in the near future, cement prices can not be expected to decrease at a rate comparable to that which has already been experienced.

As regards annual output, this may be expected to increase as population increases and new uses are found for cement. It can hardly be expected that the increase will in the future be as steady as in the past. It is rather more probable that the cement trade will in future years more nearly correspond to the condition of general business.

The next table gives the average price per barrel of Portland cement in bulk at the point of manufacture, derived from the official figures published annually by the Geological Survey. The price excludes the cost of the package, but includes the labor cost of packing.

Manufacturing Conditions.

In 1909, 103 firms reported production of Portland cement. The total number of rotary kilns reported as operating during the year was 910. These kilns ranged in length from 40 to 165 feet. Very few kilns were reported as being less than 60 feet long, and of the 910 kilns 467 were reported as 100 feet or more in length. From the reports received it is evident that the average of the operating time for all the kilns in the United States was about 70 per cent. The total annual kiln capacity of the country in 1909, deducting for a reasonable loss of time for repairs, is estimated at about 93,500,000 barrels of Portland cement. According to these figures the total production of 62,508,461 barrels was about 67 per cent of the total capacity. The average output per kiln for 1909 was about 68,675 barrels.

Demand and Supply.

Comments on the condition of the trade beyond those given in the analyses of production and prices in preceding pages would be superfluous here. The laconic comment of most of the cement producers at the close of 1909 was "demand more active in 1909, but prices lower." A very few manufacturers reported better conditions in every respect; others reported that conditions were about the same, and some few that conditions were unsatisfactory.

According to the foregoing figures regarding kiln capacity, which represent the situation exactly as reported to the Survey by the producers, it is evident that if all of the Portland cement mills at present operating were to be run full time and full capacity, it should be possible to supply the demand for cement in the United States for some years to come, without any great additions to the kiln capacity. At present there are many localities so remote from a cement plant that high freight charges render the use of cement almost prohibitive, but on the other hand if the region is sparsely settled the market is likely to be too limited to warrant the establishment of a new plant in any such locality. A large number of new plants have been projected within the last three or four years. The financial stringency of 1907 caused many of these projects to be abandoned, and more recently the keen competition which has resulted in the lowering of prices has discouraged the promotion of several other projected plants. Some of the new projects have, however, been carried through to completion, and the year 1909 saw seven plants added to the list of Portland cement producers, besides witnessing the partial construction of several others. One new producing plant is in California; three are in Kansas, one in Missouri, one in Pennsylvania, and one in Texas. Besides these, one plant in West Virginia which was idle in 1908 resumed operations in 1909. On the other hand, there were three or four plants in the United States that were idle in 1909, although operating to a certain extent in 1908. In the totals for 1908, three mills operated by one company were counted as one plant. In 1909 separate returns were received from each of these mills; therefore each mill was counted as a plant. This addition of two producers, together with two newly reporting plants in Pennsylvania, accounts for the gain of four plants in that state. In Michigan two plants which operated in 1908 were idle in 1909, and in 1909 one plant, consisting of two mills, was counted as one plant, whereas in 1908 it was counted as two plants. This accounts for the apparent loss of three producing plants in Michigan. In Alabama one plant which was operated in 1908 reported no production in 1909.

It is only a few years since the demand for Portland cement at most seasons exceeded the supply. With the increase in the number of producing plants and the increase in capacity of the older plants, stocks of cement soon became sufficient to supply the market at most seasons of the year, and recently considerable surplus stocks have at times accumulated. This condition has stimulated the marketing of cement, and at present not only the ingenuity of the user of cement is actively at work but also that of the manufacturer, in order to provide new uses and enlarging markets for the material. Although competition is now very keen between rival cement manufacturing interests, a broad coöperative policy has been adopted by the officials of some twenty-two large Portland cement companies and other interested parties, all of whom realize that whatever benefits the industry at large will ultimately benefit the individual producers. The Cement Products Exhibition that has been held at Chicago in February of recent years is the result of this broad policy of coöperative advertisement and instruction. This exhibition has become an annual affair in Chicago, and it has been announced that a similar exhibition is to be held by the same association in New York City in December, 1910.

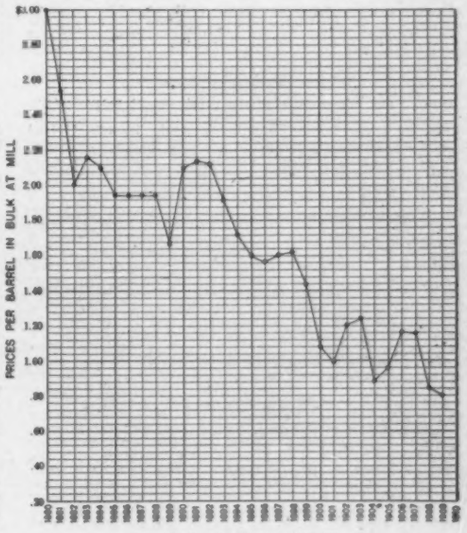


FIGURE 2.—Range in cement prices, 1890-1909.

Natural Cement—Production.

The natural cement produced in the United States during 1909 amounted to 1,527,279 barrels, valued at $623,141, as compared with an output of 1,686,862 barrels, valued at $834,509, in 1908, a decrease in 1909 of 159,583 barrels, or over 9 per cent, in quantity, and of $211,368, or over 25 per cent, in value.

The average price of natural cement per barrel at the mills was 49 cents in 1908 and 41 cents in 1909.

Puzzolan Cement—Production.

Puzzolan cement, made by mixing blast-furnace slag with slaked lime, was manufactured during 1909 at four plants in the United States. The output reported for 1909 was 160,046 barrels, valued at $99,453. This shows an increase when compared with the production reported for 1908, which was 151,451 barrels, valued at $95,468.

The average price per barrel of puzzolan cement in 1908 was 63 cents! in 1909 it was a trifle less than 62 cents.

*Eckel, E. C., The Portland cement industry from a financial standpoint: Moody's Magazine, New York, 1908, pp. 31-32, and 43-44.

Average prices per barrel of Portland cement, 1870–1909.

1870–1880	$3.00	1892	$2.11	1901	$0.99
1881	2.50	1893	1.91	1902	1.21
1882	2.01	1894	1.73	1903	1.24
1883	2.15	1895	1.60	1904	.88
1884	2.10	1896	1.57	1905	.96
1885–1888	1.95	1897	1.61	1906	1.13
1889	1.67	1898	1.62	1907	1.11
1890	2.09	1899	1.43	1908	.85
1891	2.13	1900	1.09	1909	.81

Production of Portland cement in the United States, 1870–1909, in barrels.

Year.	Quantity.	Value.	Year.	Quantity.	Value.
1870-1879	82,000	$246,000	1894	798,757	$1,383,473
1880	42,000	126,000	1895	990,324	1,586,530
1881	60,000	150,000	1896	1,543,023	2,424,011
1882	85,000	191,250	1897	2,677,775	4,315,891
1883	90,000	193,500	1898	3,692,284	5,970,773
1884	100,000	210,000	1899	5,652,266	8,074,371
1885	150,000	292,500	1900	8,482,020	9,280,525
1886	150,000	292,500	1901	12,711,225	12,532,360
1887	250,000	487,500	1902	17,230,644	20,864,078
1888	250,000	487,500	1903	22,342,973	27,713,319
1889	300,000	500,000	1904	26,505,881	23,355,119
1890 a	335,500	704,050	1905	35,246,812	33,245,867
1891	454,813	967,429	1906	46,463,424	52,466,186
1892	547,440	1,153,600	1907	48,785,390	53,902,551
1893	590,652	1,158,138	1908	51,072,912	43,547,679
			1909	62,508,461	50,510,385
			Total	458,075,856	358,423,385

a The figures for 1890 and prior years were estimates made at the close of each year, but are believed to be substantially correct. Since 1890 the official figures are based on complete returns from all producers.

Total production of cement in the United States in 1907, 1908, and 1909, by classes.

Class.	1907		1908.		1909.	
	Quantity (barrels).	Value.	Quantity (barrels).	Value.	Quantity (barrels).	Value.
Portland	48,785,390	$53,902,551	51,072,612	$43,547,679	62,508,461	$50,510,385
Natural	2,887,700	1,467,302	1,686,682	834,509	1,527,279	623,141
Puzzolan	557,252	443,998	151,451	95,468	160,646	99,453
Total	52,230,342	55,903,851	52,910,925	44,477,653	64,196,386	51,232,979

APPARENT ANNUAL CONSUMPTION OF PORTLAND CEMENT, 1902-1909, IN BARRELS.

Year.	Domestic production.	Imports.	Total available supply.	Exports.	Apparent consumption.
1902	17,230,644	1,963,023	19,193,667	340,821	18,852,846
1903	22,342,973	2,251,969	24,594,942	285,463	24,309,479
1904	26,505,881	968,410	27,474,291	774,940	26,699,351
1905	35,246,812	896,845	36,143,657	897,686	35,245,971
1906	46,463,424	2,273,493	48,736,917	583,299	48,153,618
1907	48,785,390	2,033,438	50,818,828	900,550	49,918,278
1908	51,072,912	842,121	51,915,033	846,528	51,068,505
1909	62,508,461	443,888	62,952,349	1,056,922	61,895,427

a "Imports for consumption." The figures given for all other years are for "total imports."

Apparent Annual Consumption of Portland Cement.

The accompanying table contains data on the apparent annual consumption of Portland cement in the United States for recent years. The computed results are of course merely approximations to the truth, for unavoidable errors arise from the facts that (a) both imports and exports, as reported officially, include not only Portland but small quantities of other classes of cement; and (b) no data are available as to stocks on hand at mills or at distributing points at the close of each year.

White Portland Cement.

One of the newer developments in cement manufacture is the production of white nonstaining Portland cement. Three or more brands are being made in the United States, principally to supply a growing demand for ornamental work and surface finish, both interior and exterior. The white cement is finding successful application and can be made to pass specifications for ordinary gray Portland cement. It is not, however, used as a structural cement, but rather for ornamental purposes, so that the tendency to lower strength, due to high alumina, is not a detriment. The conditions under which white Portland cement can be manufactured are rather restricted as compared with those necessary for gray Portland cement. Raw materials suitable for the white cement are not widely distributed and must be selected with great care; silica and alumina must be properly proportioned, and iron oxide must not be present in excess of 0.2 per cent in the finished cement. Therefore limestone and clay that are low in iron oxide, or preferably, practically free from this material, are necessary in the manufacture of a colorless cement. With the use of materials low in iron it has been found essential to add an iron-free fluxing material which shall perform the functions of the iron in effecting combination between the silica and the alumina. In one of the white nonstaining cements manufactured in the United States under patent rights, 2 to 5 per cent of cryolite, calcium-aluminum fluoride, is the material employed as a flux. In view of these restricted conditions the cost of manufacturing white Portland cement is considerably greater than that of gray Portland cement, and as yet the demand has been more limited; hence the manufacture is conducted on a smaller and consequently on a more expensive scale than in the case of the gray cement.

Cement in Art and Architecture.

A most promising but little developed field for the use of cement in the United States today is that of architectural and art work. In Europe, especially in Germany, cement has long been used to an important extent in ornamental and figure work. There are large opportunities for the application of cement in cornices to replace wood and metal, not only on concrete houses, but also on brick and stone structures. Besides the possibilities for the use of cement in the construction of fronts, there is a wide range of possibility in the artistic use of cement in interior decoration. Handsome mantels, friezes and cornices are being successfully made of it, and separate pieces, such as statuary, urns, lamp bases, pedestals, tables, seats and many other classes of sculptural and ornamental work, can be produced. The recent Cement Products Exhibition at Chicago, February, 1910, gave ample illustrations of the interesting possibilities in this direction.

Cement as a Road Material.

A great deal of cement is at present used in paving, principally in concrete bases or foundations for granite block, brick, creosoted block, and asphalt pavements. Pavements entirely of concrete, the top being finished with cement, have recently been laid in some small cities of the Middle West. When protected from direct exposure, as in the case of pavements surfaced with another material, the concrete foundations give good satisfaction. Contraction cracks in pavements laid wholly of concrete are, however, very difficult to avoid even when the pavement is divided into large blocks by means of joints which are designed to permit of contraction and expansion of the mass, and it is therefore a question whether or not more satisfactory methods of construction or treatment can be devised by which concrete can be used as a wearing surface for roads. This problem is being investigated by the Bureau of Public Roads, and the chief of this bureau, Dr. L. W. Page, has offered some new suggestions. According to Dr. Page, in most concrete roads the concrete is too uniformly mixed and too homogeneous in composition, and this condition may account in part for the development of shrinkage cracks where the surface is exposed to a great range of temperature. Concrete is considered too unyielding to the blows of traffic and too brittle, and therefore tends to spall.

Two general methods of preparing a concrete pavement which will obviate these undesirable characteristics are suggested by Doctor Page. In one case the use of cement mortar as a binding matrix for crushed stone is suggested, and in another the use of a mixture of semi-asphaltic base oils with Portland cement concrete is outlined. Some tests have been made by the Office of Public Roads to ascertain the practicability of such a mixture, and the results are reported as encouraging. If a practicable mixture is obtained with reduced brittleness and increased resilience and toughness, the value of cement as a road-building material will be very much increased, and the demand for it should be correspondingly enlarged.

AN ATTRACTIVE BOOKLET.

The Security Cement & Lime Co., Equitable Building, Baltimore, Md., are sending out to the trade an attractive booklet illustrating some of the important structures in which this product has been used. The publication is a very clever one and contains, not only important references to the Security Brand, but it also gives a whole lot of information regarding the mixing of concrete. Harry B. Warner, well known and popular throughout the trade, is the secretary of this company. Their products are: Security Portland Cement, (annual capacity 700,000 bbls.); Berkeley lump lime (carbonate of lime, 98.28%) for building, chemical and agricultural purposes; Berkeley run of kiln lime for agricultural purposes; Berkeley ground lime (fresh burned and uniformly ground); Berkeley ground limestone for manufacturing and agricultural purposes; fluxing stone for blast and open hearth furnaces (silica less than 1%); crushed stone for railroad ballast, road work, concrete and general building work.

DETROIT CEMENT NEWS.

Detroit, Mich., Sept. 19.—During the last month Edward C. Forte, of Fenton, has been appointed receiver for the Egyptian Cement Company, of Fenton, on the application of the M. I. Wilcox Company, creditor of the concern. The cement company, through its representative, Clarence Tinker, has agreed to the appointment of the receiver. The application for the appointment was made several months ago, and when the matter was brought up for a hearing, a postponement of sixty days was made to allow the company to effect a reorganization, if this was found possible. In his statement to the court Attorney Tinker said that such an effort had been made by officials of the company, but owing to a disinclination on the part of the creditors to allow a reorganization, it was useless to continue in the efforts to get the company established on a sound financial basis and in operating order again.

The affidavit filed two months ago in behalf of the company, asking for a reorganization, declared the assets were about $200,000 and the unsecured claims against it about $40,000. In attempting to reorganize it was intended to cancel a large share of the common stock, except such of the common stock as had been paid for in cash. This did not exceed $50,000. It was also intended to surrender $650,000 of preferred stock and issue new common stock not to exceed $700,000. The company had at that time $165,000 of its original bond issue of $200,000 unsold.

Attorney Tinker said at the time the affidavit was made it was the belief that the reorganization could be effected, and an attempt was made to get the consent of 75 per cent of the creditors interested in the $40,000 of unsecured claims. The officers, he said, had been unsuccessful in getting more than 25 per cent of the creditors to agree to the reorganization and consequently he deemed it advisable to appoint a receiver and wind up the business of the company.

The cement works at Chelsea, formerly known as the White Portland Cement Company, and later as the Millen Portland Cement Company, and which has been idle during the greater part of the last three years, is being remodeled. The plant recently went into the hands of a receiver and Jackson parties, with considerable capital, bought the plant at a very low figure. The new company is now dismantling it and preparing to reconstruct it after the most modern lines. The capacity of the plant will be increased to 1,000 barrels per day.

In a letter to stockholders, E. R. Root, secretary and treasurer of the Wolverine Portland Cement Company, of Coldwater, Mich., says that while last summer the company voted to suspend payment of dividends until such time as conditions would warrant their resumption, they hoped for an increased demand and an increase in price which would enable them to again pay their dividends—before the close of the season.

"While the demand and price have been increased, they have not yet reached a point that would justify a dividend, although the outlook is extremely bright," states Mr. Root. "The plants at Coldwater and Quincy are in full operation and are shipping 2,000 barrels daily. The surplus stock now amounts to 100,000 barrels and has tied up the capital of the company."

The increased demand will enable them to dispose of the surplus, it is said. The prices have been going up, from 78 cents four months ago to about $1 now. If the market holds good the sales of the company will place it on easy basis.

Creditors of the Saginaw Cement Company have filed a petition asking that the company be put through bankruptcy. No statement of the assets or liabilities has yet been sworn to.

"Our plant has been operating full during the month," said a member of the Wyandotte Portland Cement Company. "We anticipate a continued good business throughout the ensuing fall and winter months. We are operating capacity and expect to continue so doing for some time to come." The Wyandotte Portland Cement Company has issued a neat paperweight. It is circular and, of course, is manufactured of cement. The head of an Indian is raised.

SAND AND GRAVEL

SAND AND GRAVEL.

Production in the United States Taken From Government Statistics Compiled by Ernest F. Burchard.

The Department of the Interior, United States Geological Survey, at Washington, D. C., has issued statistics on the production of sand and gravel in the year 1909. These statistics were compiled by Ernest F. Burchard, excerpts from which we print herewith:

The total production of sand and gravel in the United States in 1909 was 59,565,551 short tons, valued at $18,336,990. This represents a net increase in quantity of 22,349,507 short tons, and in value of $5,066,598, over the production of 1908, and exceeds the production of 1907 by 17,713,633 short tons in quantity, and by $3,844,921 in value. In the year 1909 there was considerable activity in the building trades, especially in concrete construction work, consequently there was a large increase in the consumption of sand and gravel for building purposes. The production grouped under "other sand" showed a large increase in 1909, which was principally due to the increased quantities of material reported as used in railroad ballast and filling. Molding sand showed a relatively large increase in quantity, namely, over 51 per cent, and an increase of nearly 60 per cent in value over the production of 1908.

The production of glass sand in 1909 was 1,104,451 short tons, valued at $1,163,375. These figures represent only a slight increase over the production of 1908. The average value of glass sand per ton was $1.05 in 1909, a very slight increase over the average value in 1908. The average value of molding sand per short ton in 1909 was a little less than 70 cents, and of fire sand slightly under 84 cents per short ton. The other grades of sand bring much lower prices, the average ranging from about 20 cents per ton in the case of sands for filling, stone sawing, etc., to nearly 53 cents for furnace sand. The average value of building sand was about 31 cents per short ton. The average value per ton for gravel in 1909 was 25 cents, a decrease of nearly 5 cents per ton since 1908. The gravel figures include, under Missouri, 1,248,927 tons of "chats" or tailings from the zinc mines of the Flat River-Bonneterre and Joplin districts, and, under Alabama and Tennessee, a considerable quantity of chert, which is used for the improvement of roads.

The unit of measurement given in the following table of production is the short ton. Much of the sand is reported as sold by the cubic yard, a cubic yard varying in weight from 2,300 to 3,000 pounds, according to the condition of the sand and to the material of which the gravel is composed; also to the custom of the locality. All of the glass sand is sold by the short ton, and also a considerable quantity of the molding, building and other sands; hence, the quantities reported were all reduced to this unit.

Washington Sand and Gravel.

During the year 1909 field and laboratory studies were made by the United States Geological Survey of a large number of sands and gravels in localities where the construction of federal buildings had been authorized by Congress. One of the striking features brought out by these studies is the great variation in the quality of materials used for concrete aggregates in different places throughout the United States. Broadly, the sands and gravels in common use may be grouped into three classes on the basis of origin—(1) glacial deposits; (2) coastal plain deposits; (3) stream deposits. The deposits of the first and second classes have, in many instances, been modified by water action, and the third class may be considered as composed partly of materials derived from deposits of the first two classes and partly of materials derived directly from the breaking down of the country rock. All three classes of deposits contain more or less silt, clay, loam, or other very finely divided impurities.

In many communities the run-of-bank sand and gravel is used directly in concrete work without any attempt being made to clean it, except, perhaps in rare instances, by dry screenings or rough sizing. In some cases it has been stated by local contractors that the run-of-bank made naturally just the correct theoretical mixture of sand and gravel to produce the least voids in concrete. In practically all cases it has been found by experiment that these suppositions were erroneous, and that to use run-of-bank material for structural concrete work is a haphazard and careless method. It is certain that under such conditions not only is the proportioning and the sizing of the mixture indefinite and variable, but that large quantities of impurities which are unavoidably included tend to weaken the strength of the concrete. Where gravel is coated with dust or dirt of any kind, the cement is compelled to set against this film of foreign matter rather than against the gravel itself, and is consequently easily broken away from the stone. Where such impurities are mixed with the sand and gravel, the cement can not set perfectly and form a firm bond between the sand and gravel. In recent years, particularly in the large building centers, there has developed a greater appreciation of the importance of clean sand and gravel for use in concrete and mortar. Leading architects, engineers and contractors are now demanding in their specifications sound, clean, washed materials, free from dust, loam, clay or any kind of dirt. The soundness of the sand is an important consideration, since not all sands that look good and feel sharp prove to be satisfactory. Some sands are largely composed of grains of limestone and dolomite, and are softer than silica sand, and other sands may contain many grains of feldspar, which easily decays and crumbles. The presence of much mica in small flakes is also deleterious, as well as the presence of grains of pyrite and limonite. It is, of course, impossible to find deposits of sand and gravel that will yield 100 per cent of desirable material, but it is gratifying to note the improvement that may be effected in a sand or gravel by a suitable process of washing. Where sand or gravel is taken from below water in streams and lakes, a certain amount of washing is accomplished, whatever the process of excavating may be, but where the materials is pumped up from a deep stream, agitated in clean water, screened and drained, a very thorough cleaning is generally accomplished. In the case of bank deposits of sand and gravel, the material should be rolled and tumbled about in a rapid jet or stream of water, particularly streams that will size the material and deliver the oversize to a crusher. The crushed material is then returned to the washers and screens in the form of angular fragments, which are a very desirable addition to the aggregate.

Noteworthy examples of high quality river sands that are dredged or pumped and washed on a large scale are the Kaw River sand, near Kansas City, Mo.; Mississippi river and Meramac river sands at St. Louis, Mo., and Mississippi river sand at Memphis, Tenn. The sands of the glaciated area in northern Illinois and southern Wisconsin are worked on a large scale to supply the important Chicago market, and these materials are invariably washed and screened. In many smaller, though important, building centers there is, however, a surprising lack of appreciation of the importance of preparing sand and gravel for building purposes. In one large city of the middle West the practice has been until recently to use without washing the sand and gravel excavated from the cellar of a house for the mortar, concrete, and plaster that was needed in its construction. In many small buildings this plan works well enough, especially for concrete cellar floors and for sidewalks, but it is probable that better mortar and plaster might have been made had the sand been washed first. The disadvantages do not stop here, however, for all the surplus sand that may remain from the small operations is used in the construction of reinforced concrete buildings in the business section of the city, and the results have not always been what might have been desired. The locality referred to is well supplied with high-grade sand and gravel deposits that need only to be handled properly in order to produce concrete material of the most excellent type. Within the last year two plants have been erected; one dry screens the sand and gravel, the other washes and screens it; but in both cases the strong competition of the cheaper but inferior run-of-bank sand has had to be met.

LOUISVILLE SAND AND GRAVEL NEWS.

Louisville, Ky., Sept. 20.—All of the sand and gravel companies in Louisville are busier than they have been for several months. The work on the local sewers, as far as that part of it requiring sand is concerned, is about completed, but there are lots of big concrete jobs going on, while a large amount of street work is also in prospect.

The new Kentucky & Indiana Bridge has been begun, and the contractors are getting ready to put down the big concrete piers. The contract for the sand and gravel has not yet been let, but is expected to be one of the biggest handled in a long while.

The Ohio River Sand Company is now installed in its new office building at Brook and the River, and those connected with the firm are very much pleased with the building and with themselves. John M. Settle goes about smiling continuously, if one be allowed the use of the expression. The building is of vitrified brick, with concrete foundation, and is two stories high. It is steam heated and is supplied with toilets and other conveniences, which make it the best structure of its kind on the river front.

Business with the company is rushing, and both diggers are at work getting out sand. The company has let contracts to the Frey Planing Mill for the erection of a stable, wagon shed, harness room and residence to be built on its property at Clay and Franklin. The cost of the improvements aggregates $15,000.

Henry L. Kremer, 52 years old, president of the Ohio River Sand Company, died at his residence in this city recently after a long illness due to a complication of diseases. He was in the contracting business and was at one time wharfmaster. He organized the concern of Kremer & Co., and afterwards became head of the sand company.

Business with the Nugent Sand Company has been very good of late, and the company's two diggers, at Six-Mile Island, have been working overtime. Lots of concrete jobs and street work are making business O. K.

BIRMINGHAM SAND AND GRAVEL NEWS.

Birmingham, Ala., Sept. 20.—Conditions in the sand and gravel market of this city are very encouraging. It is very seldom that sand is sold in very large lots, for this article, it seems, can be obtained almost any time and, as a result, builders usually buy in small quantities.

The six sandpits of the Carolina Portland Cement Company, situated in Alabama and Georgia, are working continually. The only trouble is that cars cannot be secured fast enough to haul them.

The Fulenwider Building Material Company reports a very good amount of sales in sand during the past month.

J. F. Baldwin has had a very successful month with sand. In addition a very large number of small orders, Mr. Baldwin has filled several large ones, calling for many carloads.

Production of glass sand, other sand, and gravel in the United States in 1908 and 1909, by States and uses, in short tons.

1908.

State.	Glass sand.		Molding sand.		Building sand.		Fire sand.		Engine sand.		Furnace sand.		Other sand.		Gravel.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Alabama	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arizona	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arkansas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
California	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Colorado	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Connecticut	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Delaware	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Florida	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Georgia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Illinois	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Indiana	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Iowa	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Kansas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Kentucky	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Louisiana	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Maine	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Maryland	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Massachusetts	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Michigan	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Minnesota	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mississippi	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Missouri	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Montana	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nebraska	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New Jersey	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New Mexico	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New York	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
North Carolina	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ohio	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Oklahoma	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Oregon	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pennsylvania	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
South Carolina	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
South Dakota	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tennessee	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Texas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Utah	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Vermont	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Virginia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Washington	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
West Virginia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wisconsin	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wyoming	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Other States b	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

a Included in other States.
b Includes Arizona, Maine, Montana, South Dakota, and Wyoming.

Production of glass sand, other sand, and gravel in the United States in 1908 and 1909, by States and uses, in short tons—Continued.

1909.

State.	Glass sand.		Molding sand.		Building sand.		Fire sand.		Engine sand.		Furnace sand.		Other sand.		Gravel.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Alabama	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arizona	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arkansas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
California	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Colorado	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Connecticut	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Delaware	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Florida	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Georgia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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a Included in other States.
b Includes molding sand.
c Included in glass sand.
d Included in molding sand.
e Includes glass sand.
f Includes Arizona, Hawaii, Idaho, Maine, Montana, Nevada, and North Dakota.
g The exact output of glass sand was 1,104,451 tons, valued at $1,163,375.
h The exact output of molding sand was [illegible] tons, valued at [illegible].
i Includes sand for grinding and polishing stone and glass, sand for filtration plants, sand for railroad filling and ballast, for molding brick, for making asphalt pavement and blocks, etc.

"Business has been good with us," said Eberts Brothers, Wyandotte dealers in builders' supplies. "We anticipate a big building season in the suburban districts during the fall and early winter. Contractors are busy and there are numbers of men in line for work. There have been no changes in quotations during the month."

The Builders' & Traders' Exchange members enjoyed their annual outing at Shore Acres, just across from Detroit on the Canadian shore, recently. Dinner was served and a baseball game played between the contractors and material supply men. We will not attempt to give the score—it would be unfair to both sides. But let this suffice, both, we forgot, all the pitchers kept the hits well scattered. That is, some were in left, some in center, some in right, some over the fence into back lots. Well, anyway, they were well scattered. Other games were also enjoyed. About one hundred and fifty took part in the festivities.

FINE SAND AND GRAVEL PLANT.

Baltimore, Sept. 16.—There is but one large sand and gravel concern in Baltimore, and it has the distinction of being one of the largest and most extensive in the country. It is the Arundel Sand & Gravel Company, which is furnishing sand and gravel for the most important building operations in Baltimore and the South.

One of the largest contracts ever landed by the company was awarded a few days ago when the Florida East Coast Railroad Company contracted for the sand and gravel for the new extension of that railroad over the Florida Keys. The contract calls for several thousands of yards of both sand and gravel and it is being shipped as fast as boats can be loaded for the South.

The company is also furnishing sand and gravel for the important building operations in Baltimore, including the new high buildings in course of erection in the business section of the city and the sewerage and paving work. It also ships its product to many southern cities.

The new plant of the company is located on Pier 2 of the city's new dock system, and is one of the most complete in the country. It is built of gravel concrete and has a capacity of 10,000 tons, or 22 tons to the square foot. There is a large traveling derrick on top which lifts the sand and gravel from lighters to the bins. The structure cost about $25,000.00.

The company has an almost inexhaustible supply of sand and gravel, as it has leased the entire shore of the Patapsco River for nearly three miles below the city. The sand beds are the most extensive on the Chesapeake and the kind for building purposes.

The plant was built by the Raymond Concrete Pile Company, Security Portland Cement being used.

The Evansville (Ind.) Sand & Gravel Company has brought suit against J. A. Crawford, Kate Hawley and William R. Carroll for $305, due for sand and gravel furnished. The defendants gained considerable note by their attempt to establish a "model city" near Henderson, Ky. The plan was working out all right when the promoters ran short of cash.

SPRINGFIELD SAND AND GRAVEL NEWS.

Springfield, Ill., Sept. 21.—"We have trouble keeping up with our orders at present," said A. F. Hemphill, secretary and treasurer of the Virginia Timber Company of this city to the ROCK PRODUCTS representative. "In addition to the regular run of sand and gravel business we are supplying material for the Washington street paving, the improvements at the plant of the United Zinc and Chemical Company, the $30,000.00 paving contract which R. F. Egan of Springfield, has secured at Taylorville and the Schultz & Banyan concrete grain elevator at Beardstown." Farmers are becoming valuable in Central Illinois sand and gravel trade, according to Mr. Hemphill, who is optimistic at the increased use of concrete. This firm has two gravel pits at Pekin, Ill., a sand pit, six miles south of Pekin, one at Kilbourne, Ill., and one at Chandlerville, Ill.

"Retail trade in sand and gravel is better," declared E. W. Hocker & Sons.

Conditions for the trade are all that could be reasonably asked, according to J. H. Schuck & Son.

The Elmore & Caldwell Construction Company, of Havana, is now pumping sand and gravel from the Illinois river at Havana.

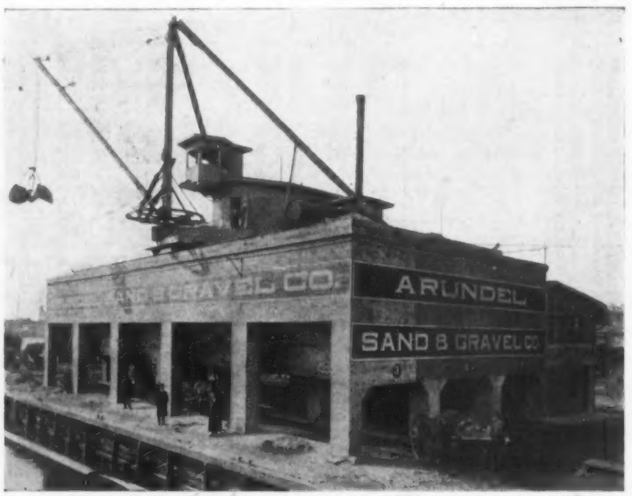
The Vandalia railroad has opened a new sand and gravel pit near Mackinaw. Two shovel crews have been busy there.

A. A. Campbell, of Chicago, and several gentlemen of La Fayette, Ind., recently formed a company with a capitalization of $200,000.00 to handle gravel and crushed limestone in the vicinity of La Fayette. The company recently purchased the old Wabash and Erie canal property from the southern limits of La Fayette to the Fountain county line. Machinery will be put in to wash and load the gravel and to crush the sandstone, and the company expects to expend $50,000.00 in getting ready to market its product. The Monon Railroad will extend a spur from a point near the Elston road to the Chessman land to handle the gravel and crushed stone taken out by the company.

The Knoxville Sand & Supply Co., of which Lyon C. McMullen is president; W. B. McMullen, secretary and treasurer, Knoxville, Tenn., are producers and shippers of sand, lime, river gravel and crushed stone. They also handle ornamental terra cotta, Sparta face brick, Saga fire doors and shutters, Acme plaster and Keene's cement and venetian blinds. They have a producing capacity of 200 yards of sand per day and ship in car lots, their trade extending from Chattanooga to Bristol.

A bill asking that a receiver be appointed for the Oxford Sand & Gravel Co., Chicago, was recently filed in the Superior Court. The bill alleges that the company is wholly insolvent and that it ceased doing business August 29. Oscar W. Nelson, president of the company, is also made defendant in the proceedings.

The city of Kenosha, Wis., has declared war upon the sand suckers from Milwaukee and other points along Lake Michigan that take sand from the beach near Kenosha. An ordinance has been passed making it unlawful to remove this sand, and it is planned to arrest any offenders.



PLANT OF THE ARUNDEL SAND AND GRAVEL COMPANY, BALTIMORE, MD.

ADDED TWO BARGES.

J. W. Thompson, of St. Louis, known as the "Southern gravel king," has added two steel barges to his lower Mississippi barge system, which annually transports about 125,000 tons of ballast gravel to various railroads.

The Illinois Central Railroad has contracted for 2,000,000 square yards of the material, to be furnished during the next four or five years. The Thompson barge system now comprises nine barges, thirty-five railroad cars, a locomotive and three tugs, representing an investment of about $300,000.00. The system transports from thirty-nine to fifty-two railroad cars per day. The gravel is procured from the Mississippi River at Profit Island, about twenty-four miles north of Baton Rouge. Prout Island is about five miles long and from half a mile to a mile wide, and is owned by an estate which practically gets a perpetual royalty out of it. In connection with the Thompson system are two dredge-boats, costing about $60,000.00, which are used to pump out the gravel from the river bed. About forty men are employed to work the system, which is operated day and night.

WILL DEVELOP SAND PIT.

Martin Swintek, of Des Moines, Ia., has closed a lease for seven acres of the John A. Timmons farm, near Marietta, and is preparing to develop a large sand and gravel pit there. The lease is for a period of five years, Timmons receiving $1 a car for cars of a capacity of over 60,000 and 75 cents a car of a capacity of less than 60,000 pounds capacity.

The Block Forty Sand Co. has been chartered at Denver, Colo., with $10,000.00 capital stock, by John H. and E. Cower and James Grafton.

Announcement has been made by the Atwood-Davis Company, of Beloit, Wis., of the consolidation of fourteen of the largest sand and gravel companies of the country. The consolidation was made for the benefit of the concerns interested and to establish a scale of prices. Shipping facilities will also be bettered, as the companies plan to cooperate in filling orders.

Secretary to the city council, M. J. Babin, White Castle, La., has filed a protest with the Railroad Commission of Louisiana against the raise of freight rates on gravel and sand from Profit Island to New Orleans and intermediate points. More or less of this material is used by the city from time to time.

The contract has been let for the main building of the plant which the Edgemore Sand & Gravel Company will erect at West Pittsburg, Pa., to Leonard & Company. The order has also been placed for the machinery, which will cost something like $16,000. This company has 137 acres of sand and gravel. The Baltimore & Ohio Railroad is building a switch to the property, and the company will push the business vigorously.

The Crystal Lake Sand Company has been incorporated at Algonquin, Ill., with a capital stock of $5,000.00, to deal in sand and building materials, by Henry N. Miller, S. M. Schall and Amelia Meyer.

The Hawkeye Sand & Gravel Company, Des Moines, Ia., has been incorporated with a capital stock of $25,000.00, by G. S. Lane, W. C. Johnston, Henry Teget, G. A. Slatford, and F. I. Gardiner.

The Houston Gravel Company, Eagle Lake, Texas, has been incorporated with a capital stock of $15,000.00, by E. E. Reed, J. J. Reed, J. L. Baughman and S. M. Baughman.

The Shanhoma Pure Sand Company has been incorporated at Oklahoma City, Okla., with a capital stock of $6,000.00, by V. L. Bath, D. P. Weaver and C. L. Maguire, all of Oklahoma City.

The Torpedo Sand and Construction Company, Lawton, Ill., has been incorporated for $50,000.00, by P. Beggs of Oklahoma City, W. X. Stevens and C. M. Meyers, of Lawton.

The Great Northern Sand & Stone Company, capital stock, $20,000.00, has been organized by L. M. and W. J. Uber and John Elder, Jr., of New Castle, Pa., to deal in sand and stone.

Schedules in the assignment of the Hudson River Sand & Gravel Co., 5 Beekman street, New York City, show liabilities of $1,061.00; nominal assets, $16,407.00; actual assets, $402.00.

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FLUXING STONE FOR BLAST AND OPEN HEARTH FURNACES
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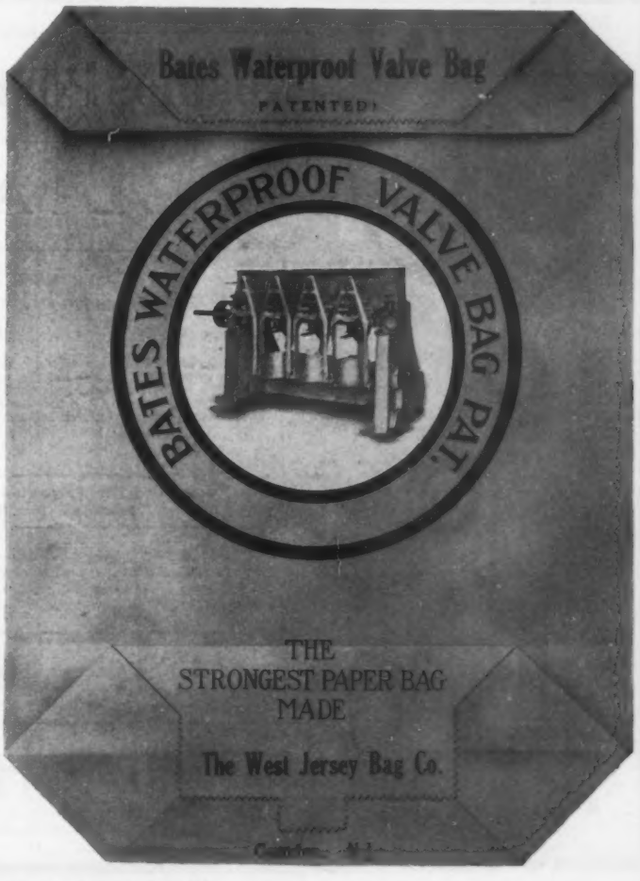

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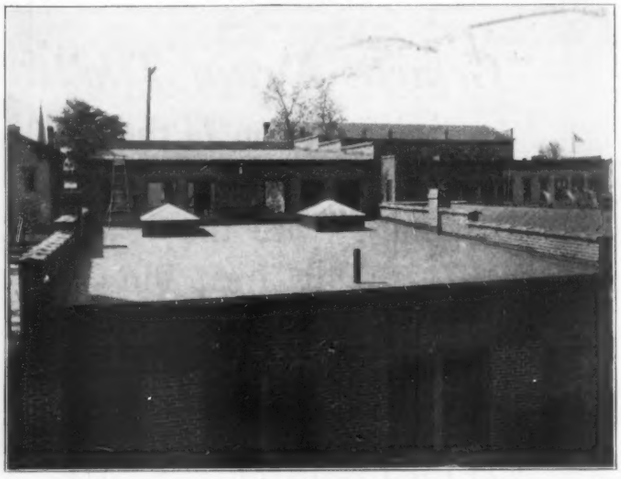

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Paul Jones Building,
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WAR DEPARTMENT
ENGINEER OFFICE, UNITED STATES ARMY.

Nashville, Tenn., February 20, 1909.

KOSMOS PORTLAND CEMENT COMPANY,
Louisville, Ky.

Dear Sirs:—Replying to yours of the 12th instant, I beg to advise you that our records show that 22,250 barrels of Kosmos cement were received at Hales Bar, Tennessee River, for the lock under construction at that point, between June 23 and September 25, 1908. All of this material was tested and all of it accepted under the requirements of the Engineer Department specifications.

Very respectfully,
WM. W. HARTS,
Major, Corps of Engineers

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Fred P. Sutcliffe. Price $1.00.

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By Edwin C. Eckel, C. E. Price $2.00.

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THE CEMENT SHOWS.

The entries for exhibits at the two cement shows to be held in New York and Chicago, respectively, are very satisfactory, both in regard to numbers and quality. The entries up to date for the New York show are 107 and for the one at Chicago, 113.

Amongst the exhibitors are numbered many of the leading producers of cement, materials and machinery.

SOUSA WILL FURNISH MUSIC.

For the New York Cement Show in Madison Square Garden, December 14-20, 1910, the management of the Cement Products Exhibition Co. have engaged the services of Sousa and his full band for the entire period of the show. This is the first instance where a musical organization of such reputation and standing has been engaged in connection with any trade or industrial show.

The engagement of Sousa and his band at the New York Cement Show will be his last appearance in America before his departure for Europe. The first concert of Sousa and his band abroad will be in London on January 2. After playing two months in Great Britain and Ireland, Sousa will proceed to Paris and from there, through France and Switzerland. Embarking at Marseilles, the great conductor and his band, leave for Aden, Arabia, and from that point the band goes to Columbo, Ceylon. Australia will be the next stop in the world tour. After giving many concerts there, New Zealand will be visited and the homeward trip will be made by way of Japan, where a number of appearances have been arranged for. Leaving for America again, the band will land at Vancouver and will play several engagements en route to New York.

The eleven farewell concerts which will be played at the New York Cement Show, will give the public an unprecedented opportunity of hearing this famous body of trained musicians at their best.

OKLAHOMA CEMENT USERS.

The third annual cement show and educational exhibition of the Oklahoma Cement Users and Contractors' Association will begin next week, Tuesday, September 27th, and will continue to October 9th. It will be held in the new cement building in connection with the Oklahoma State Fair. All communications should be addressed to E. A. Mossman, Oklahoma City, assistant secretary of the Cement Users' Association.

NEBRASKA CEMENT USERS.

Oakland, Neb., Sept. 15.—The executive committee of the Nebraska Cement Users' Association met early in the month and decided to hold their annual convention at Omaha, Neb., at the Auditorium, February 1, 2, and 3, 1911.

This association was organized in 1906, and the present officers are as follows: H. C. McCord, president, Columbus; G. F. Lillie, vice president, North Bend; Peter Palmer, secretary-treasurer, Oakland.

This is one of the most successful state associations in this country and their sessions and exhibitions are always well attended. Secretary Palmer, who is the right man in the right place, is already at work on an attractive program. Those who expect to make exhibits at the show should get in communication with the secretary at once so that space may be reserved.

CONCRETE ROADWAYS.

Our first concrete roadway was laid in 1896, and now has nearly fourteen years of life and usefulness to its credit, and is still continuing its service without having cost one cent for repairs.—City Engineer, Richmond, Ind.

Superintendent H. A. Tice, of the western division of the Santa Fe Railroad, is completing at Hutchinson, Kan., a large bed of concrete beneath the many tracks crossing a street in that city, and it is said that this piece of roadbed is the most durable and smoothest along the line of this system. If found satisfactory on further trial, the plan will be adopted in other cities through which the road passes where improvements are required.

LORADO TAFT.

The Celebrated Chicago Sculptor Busily Engaged on a Monumental Concrete Statue of an Indian.

There is now being completed above Eagle's Nest, across the Rock river from Oregon, Ill., the most remarkable monumental concrete structure that has ever been erected in this country. It is a statue cemented into the solid rock as a foundation, and rising 48 feet in height, representing the first Americans, personified in a figure of the famous Indian chief, Blackhawk. The entire structure is built of concrete and is a product of the genius of the famous sculptor, Lorado Taft, who has spent three years of labor and a large amount of money in perfecting this masterpiece.

The site selected for this American Sphinx is most ideal, the setting being so typical of the conception in every way. Aside from the romantic sentiment generated by a contemplated view of this beautiful spot, is the grandeur with which this mammoth figure rises from a foundation, the top of which is in itself 250 feet above the surface of the water below.

STATUE OF INDIAN IN CONCRETE, FORTY-EIGHT FEET HIGH, MODELED BY LORADO TAFT.

This is the first instance of concrete being applied in modern times to the art of sculpture, and it opens a vast field for future development. It not only furnishes a memorial to the first Americans, but it constitutes also a monument to the infancy of the concrete industry in America that will endure for all time, and in future ages continue as much an object of wonder and admiration as the pyramids of Egypt, or the concrete memorials of the Parthenon of Rome, are to the people of the present day.

Mr. Taft first conceived the idea of executing this work in concrete through a tour of Europe thirteen years ago, when he discoverd that many of the best preserved ancient works of art were made from this material.

For the foundation thirteen feet of soil had to be removed before bedrock was struck. Here the top of a natural ledge of stone was reached. The ledge thirty feet deep is formed of a succession of stones which have the appearance of being built artificially as they show on the river bluff.

There have been difficulties in the engineering part as a great concrete statue has never been made before. A gallon of water a minute is used in mixing the concrete, and a motor had to be installed and a windlass for getting it up. The first model was of plaster six feet high. This was enlarged by careful measurement to a frame of scantlings around an "elevator shaft." When the whole figure had been framed in lumber the surface was made by stretching wire netting over the timbers. Over these forms burlap was fastened with nails. Two pointing machines had to be built, one for the head and one for the body.

The modeling was done by the scantlings and the arms shortened here and there until the proportions of the model were reached. Later the burlap was painted over with plaster of paris, giving the appearance of a plaster cast. Meanwhile the head was modeled in clay and cast by the usual process, the piece mold being saved for use again in casting the concrete. Now the mold is being made in plaster around the model.

The mold is about three inches thick and will require over ten tons of plaster, with many timbers for support. When complete everything will be taken out of the mold and the space filled with the concrete, all but a shaft seven feet in diameter running the entire length of the figure. An opening back of the folded arms of the statue will allow of a man passing up the shaft and looking out of invisible windows thus formed.

An assistant has had the mechanical work in charge and a corps of three men have been kept busy ever since work was started on the concrete. During the first year, when the first measurements were being taken, the wooden structure blew over in a cyclone. Then a whole year's work had to be done over again. It has been a labor of love with Mr. Taft, and work for work's sake. The expense of the undertaking has been borne by him, although a whole colony of artists at Eagle's Head and Mr. Heckman, on whose land it stands, are more than anxious to assist. Every care for the solidarity of the structure has been taken by consulting engineers, and the following are some of the items in their calculations:

Cubic contents of statue, 2,275 square feet.

Total weight of statue and foundations, 536,770 pounds.

Total maximum wind pressure acting on statue, 28,980 pounds.

Overturning effort of wind pressure, 673,785 foot pounds.

Total moment of resistance to wind pressure acting through center of gravity on eighteen foot base, 4,830,930 pounds.

The base of the statue is concrete of 18x18x3 feet.

What will become of the artist's dream of an enduring American statue if speculators get hold of the land is the natural question asked. The best hope that this will not happen is in the fact that Wallace Heckman, attorney for the Chicago University, is owner of the land on which the monument stands, and for a hundred acres around. It is his desire to hold it during his lifetime as a tract of natural forest, and his enthusiasm in the perpetuation of the statue is so great that it is believed that he will do everything in his legal power to make it enduring.

CONCRETE PAVING IN DENVER.

Until the Board of Public Works is sufficiently satisfied that cement concrete is thoroughly practicable, no action will be taken on the petition presented by property holders along certain thoroughfares asking that this system of paving be adopted. It is proposed first to experiment on a road near the city limits before trying it on any of the principal streets of the city.

Arrangements have been made by the mayor and the board to pave a portion of the road of the drive to Colorado Springs. This is to be sixteen feet wide, and as this is the principal automobile drive of the state, the Good Roads Commission and opinion of autoists will help to determine whether or not it will prove to be the best.

Different cement companies have agreed to furnish cement for the experiment at cost, and as sand and gravel are in abundance on the ground, the experiment can be made at a very low cost.

The Seacliffe Cement Brick Company has been organized at Wilmington, Del., with a capital stock of $500,000.00. The incorporators are Sylvester D. Townsend, Jr., Wilmington, Del.; Joseph P. Egar and Edward C. Haley, Philadelphia.

The Baltimore-Ferro Concrete Company, of Rome, N. Y., is now preparing the ground for the erection of the derricks just east of Mill street, where the re-located highway will cross the large canal. A new concrete bridge is to be built there by this company.

THE MODEL CITY OF COREY, ALABAMA.

(Continued from Page 3.)

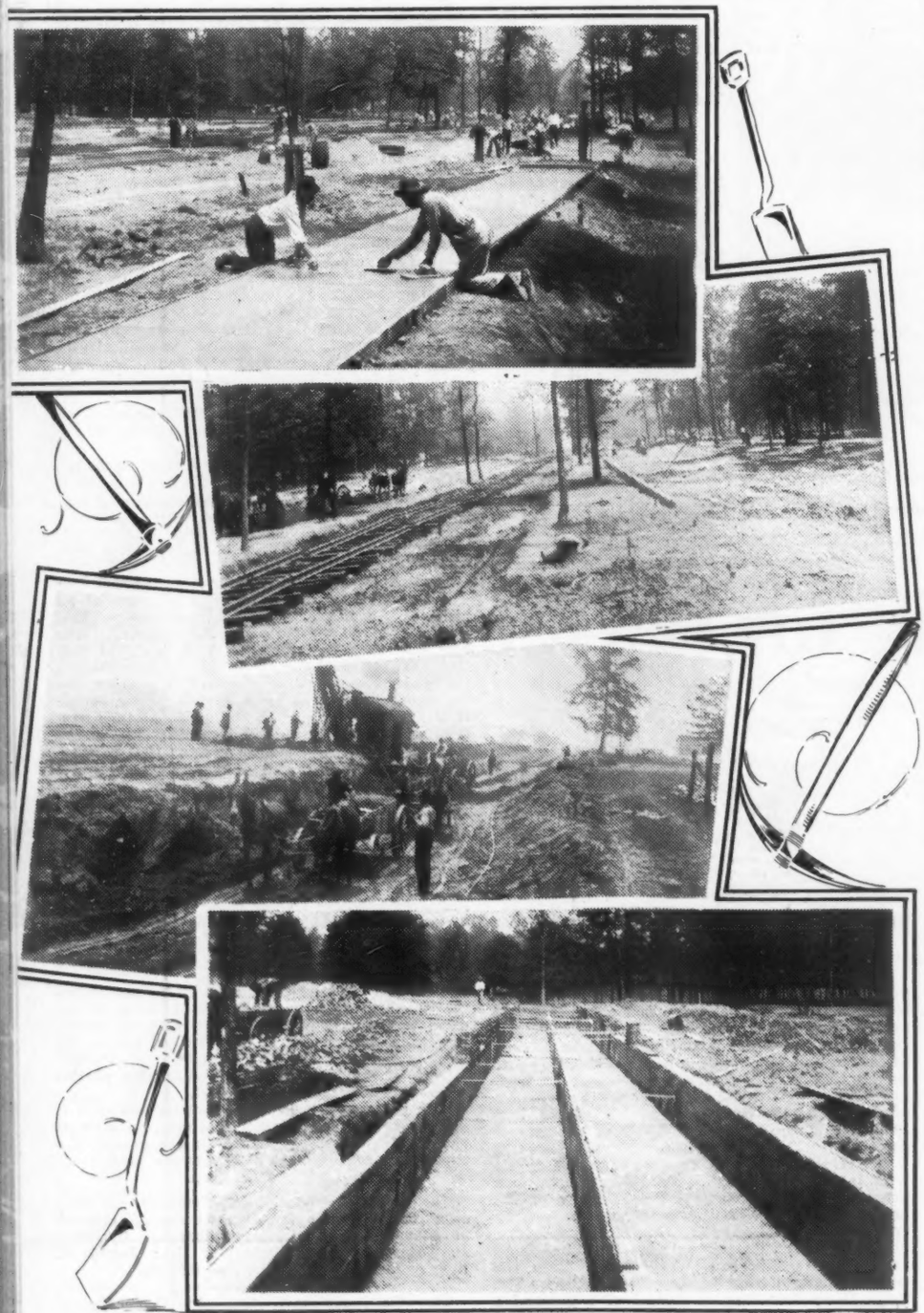
the nucleus of its southern developments for the same reason that Gary, Indiana, was selected to be its western center; for here at this site, which lies in a valley between mountains of ore on one side and coal mines and limestone fields on the other, equipped with excellent railroad facilities, raw materials can be assembled cheaper than anywhere else in the South.

As the construction work was to begin immediately, it soon became evident that the laborers needed homes, and the citizens of Birmingham were appealed to, and called upon to furnish habitations for the workingmen of the new industrial center. Therefore, with all the vim and energy characteristic of the people of this district, the Corey Land Company, headed by a brilliant young man, Robert Jemison, Jr., and with some of the leading men of the city as its directors, was formed.

Two hundred and fifty acres were bought adjacent to the property of the Steel Corporation, and six and a half miles from the business section of Birmingham.

The acreage was divided into 1,250 lots, which were placed on the market. Over 300 were sold in two weeks, and many homes are being built, for already at least 500 houses are in demand, and even more will be needed to accommodate the 8,000 people who will be settled at Corey by the arrival of winter. The land company itself is erecting about fifty model homes, costing from $1,500.00 to $6,500.00 each, contracts for which have already been let, while the remaining 150 will soon be built by the buyers.

To most people the words "workingmen's town" bring visions of dingy, shanty-like houses, dirty, narrow streets, lack of comfort and general filth. However, it will not be so with Corey, for the people who are back of it look upon the laborer in the twentieth century light—that is, they realize that the more comfortable his surroundings the better the class of his work will be.



1. LAYING PART OF THE TWENTY MILES OF CEMENT SIDEWALKS. MAIN STREET.
2. PART OF THE DOUBLE TRACK STREET CAR LINE ON THE MAIN BOULEVARD.
3. STEAM SHOVEL AND TRACTION ENGINE AT WORK ON GRADING.
4. SECTION OF DOUBLE BOX CONCRETE STORM SEWER 1,200 FEET LONG, 14 FEET WIDE AND 3½ FEET DEEP.

Immediately after the forming of the company, Mr. Jemison began a study of town building, and engaged a famous landscape artist to work out the best plan possible for the treatment of the place. With the assistance of this expert a city was planned that combined practical simplicity and artistic beauty, a city that can not be surpassed in the entire country for comfort and general excellence of plan.

Each home will be the very synonym of comfort and beauty, for even the dwellings of the humblest laborers will be graced with green lawns, spacious playgrounds and blooming gardens, where the simple workers may live in a manner unknown to the laborers of most manufacturing towns.

The heart of the town will be a broad plaza to be called the "Civic Center," where will be located the city hall, the hotel, the First Bank of Corey, the Y. M. C. A., the public schools and the public library. In addition to this feature, all the streets will be wide and well paved, while the entire town will be beautified by winding boulevards and beautiful parks.

One of the most objectionable features of a manufacturing town is the smoke nuisance, but as Corey will be an essentially up-to-date city, this evil will be entirely eliminated, for the plants of the American Steel and Wire Company will be run by electricity, while the smoke of the coke ovens will be utilized in the manufacture of by-products such as coal gas, coal tar, ammonia, etc.

The water of Corey will be furnished by the great impounding dam of the Tennessee Coal, Iron and Railroad Company, which is being erected at the enormous cost of $2,000,000, and as a result, for years to come the problem of ample and cheap water for the industries of the steel corporation will be solved.

There have been many large contracts for street improvements in the South, but the contracts let by the Corey Land Company surpass all in magnitude. However, what is more interesting is the fact that some of the quickest work ever done by contractors and engineers has been accomplished here; indeed, with such swiftness did the men work that in eight weeks over one-half of the work was completed. Countless numbers of men, teams, shovels and traction engines, like a mighty army with but one object, are waging a fierce and incessant fight against Father Time, and as a result are accomplishing the work of months and years in days and weeks. Contractors are racing each other, an expert landscape architect, thirty engineers, and assistants, architects, mechanics and even common laborers are working with machine-like speed, and straining every energy to finish this great model city on time. Indeed, the eyes of the entire contracting world are concentrated on this formerly unknown spot in Alabama, for even experts can not comprehend how so much work has been accomplished in so few a number of weeks.

The following list shows what is being done in Corey at the present time:

One hundred and eighty-six thousand cubic yards of dirt are being moved for grading purposes.

Three miles of vitrified brick, tarvia, bitulithic and various other kinds of paving are being laid.

Twenty miles of macadam roads are being constructed.

Two and one-half miles of double track street car line are being laid through the town.

Twenty miles of combination cement curb and gutter are being constructed.

Twenty miles of cement sidewalks are being laid.

A storm sewer 1,200 feet long, 3½ feet deep and 14 feet wide is nearing completion.

Eight and one-half miles of gas mains are being laid.

Eight and one-half miles of water mains are being laid.

A fifty-room hotel with stores, lobby and cafe on ground floor is being erected.

A large bank building is being built.

Fifty residences, costing from $1,500.00 to $6,500.00, are being erected.

One hundred residences at a cost of $1,250.00 to $4,000.00 are being constructed.

Thirty stores at a minimum cost of $10,000.00 each are being erected.

The contracts already let for street improvements amount to $396,000.00, which constitutes about 60

per cent of the total. The remaining contracts will be let later on.

An interesting fact in connection with the building of Corey is that all of the contracts were awarded to local firms, among whom might be mentioned: Dun & Lallande Brothers, Long & Haggarty, of Bessemer, a suburb of Birmingham, The Southern Bitulithic Company, and the McCartin Construction Company.

What has been accomplished is already remarkable, but this is merely the beginning, only the nucleus of a great industrial center to be, for with such a good foundation to start upon there is no doubt as to the future greatness and prosperity of Corey. Indeed, when the city is completed it will not only stand as a monument to the industry and energy of those who with fairy-like swiftness converted a field into a throbbing city, but also will be the living realization of the twentieth century ideal, which believes that the workingman is just as much entitled to comfortable and healthy surroundings as the millionaire, and in addition will serve for years to come as the embodiment of all that a great city should be or strive to be.

MODEL CONCRETE COTTAGE.

One of the most interesting exhibits at the coming cement show to be held in Madison Square Garden, New York City, from December 14 to 20, 1910, will be the model concrete cottage which was awarded the first gold medal in a competition for designing sanitary, inexpensive, workingmen's homes, held at the late National Congress on the Prevention of Tuberculosis, held last year in the Natural History Museum in New York City.

The house was designed by Architect Milton Dana Morrill, of Washington, D. C., and it created much public interest at the time. The house is of reinforced concrete throughout and is a two-story, five-room cottage. A number of homes of this type are being built at Virginia Highlands, a new suburb of Washington, D. C. Here all the houses are to be of the poured cement type, and the gardens, public parks and playgrounds are all decorated with cement furniture and equipment, and all are cast in new style steel molds, bringing these model homes well within the reach of the wage earner. According to the specifications the walls are eight inches in thickness and the floors are four and one-half inch reinforced slabs. One carload of Portland cement is sufficient for the construction.

Every room has windows on at least two sides, thus giving ample light and ventilation. The windows are of the casement type, swinging out, with no trim. While the house is of a plain box-like appearance, much has been done to enhance its beauty by the use of window boxes, flowers and vines and a little exterior decoration in ornamental concrete. The house is so built that it may be thoroughly cleaned with a hose, the cement floors being graded to plugged spouts to discharge on the lawn. There are absolutely no places inside the house for the shelter of dust, vermin or insects.

It is expected that much public interest will be centered on this exhibit at the New York Cement Show in December, as it excellently demonstrates the possibilities of reinforced concrete construction in the building of inexpensive homes.

A PROGRESSIVE CONCERN.

The Salina Hydraulic Stone & Brick Co., Salina, Kan., are making 250 to 300 concrete blocks per day. I. C. Henry is president and manager, and J. Duncan is secretary and treasurer. The plant occupies ground 60' x 400', and was incorporated under the state laws of Kansas for $15,000.00. They are wholesale manufacturers and dealers in concrete, stone, cement, plaster and Sacket board, sand and gravel, handling many specialties. The firm is exclusive agents for Selinite Oklahoma Plaster.

CONCRETE MACHINERY AT JOLIET.

Joliet, Ill., Sept. 20.—Work has commenced on the erection of a $20,000.00 plant here by the Joliet Concrete Machinery Company. The plant will include a foundry, machine shop, block drying room and workshop, and the buildings will be constructed entirely of concrete blocks made by the company. The capital stock is $25,000.00, and the officers are: L. J. Birn, president; James Stratka, vice president; and Frank Barthelme, secretary and treasurer.

Among the different kinds of machinery to be manufactured are the rapid process block press, vapor curing plant, batch mixer, and post molder. These are all the work of President Birn. He learned the business in Denmark, his native country, and perfected it through years of study in America.

REPORT OF COMMITTEE ON EXTERIOR TREATMENT OF CONCRETE SURFACES.

(Read before the National Association of Cement Users' Convention.)

By L. C. Wason, Chairman.

The committee submits herewith a progress report not with the idea that it is perfect or complete but with the strong desire that it form a basis for discussion and that from the discussion a more complete and concise statement of the subject can be prepared and specifications which will enable anyone fairly experienced in the art to do good work.

Plan and Scope.

A synopsis of the ground the committee is proposing to cover is given below. It is not assumed that this synopsis is perfect and any subjects which should properly be treated by this committee and which have been omitted, will be added to this synopsis.

I. Effect of Material and Workmanship on Surface.
- (A) Cement.
- (B) Sand.
- (C) Stone.
- (D) Foreign matter, active or inert (glass, oil, glue).
- (E) Water.
- (F) Pigments.
- (G) Effect of molds.
- (H) Method of mixing and placing.
- (I) Treatment while hardening.

II. Removal of Surface in Various Ways.
- (A) Unskilled labor. Picking, scraping, rubbing, whether hard or green.
- (B) Skilled labor. Crandall, bush hammer, tooth tool, chisel, set, lathe.
- (C) Sand blast (size of nozzle).
- (D) Chemical treatment (kind, strength, method).
- (E) Age of cement when cut or treated.
- (F) Tools, kind, quality, temper.
- (G) Effect of cutting on impermeability.
- (H) Effect of cutting on durability.
- (I) Effect of cutting on collection of dirt.
- (J) Advantages and disadvantages of certain treatments.
- (K) Photographs.

III. Coating Surfaces in Various Ways.
- (A) Texture and condition of masonry surface to be covered. (Masonry includes brick, terra cotta, stone, concrete, mortar, plaster.)
- (B) Metal lath, kinds, method of erection.
- (C) Preparation of base to obtain a bond.
- (D) Material, cement, sand, lime, pigments.
- (E) Mixing.
- (F) Placing, number of coats, and treatment of each, workmanship, texture.
- (G) Joints.
- (H) Washes, cement, etc.
- (I) Paint.
- (J) Enamel.
- (K) Durability.
- (L) Photographs.

IV. Ornamental Work. Possibilities and Limitations of Surface.
- (A) Cast concrete.
- (B) Cast mortar.
- (C) Plastered mortar.
- (D) Kinds of molds. Wood, plaster, iron, glue, sand (plain or treated), clay, sanded paraffine.

V. Waterproofing.
- (A) Necessity.
- (B) Mixed in concrete, either as a powder or a liquid.
- (C) Method of incorporation.
- (D) Surface treatment where the compound is colorless.
- (E) Surface treatment where the compound changes the color of the surface.
- (F) Durability of each material.
- (G) Effectiveness of each material.
- (H) Preparation and condition of surface to receive each of above treatments.
- (I) Mortar.

VI. Limitations, Defects, Blemishes of Various Sorts and Remedies.
- (A) Range of colors.
- (B) Variation of color due to workmanship and weather.
- (C) Craze cracks.
- (D) Expansion and contraction cracks.
- (E) Irregular size (bulging of molds).
- (F) Mortar and stone at horizontal joint between days' work in concrete wall.
- (G) Patches are a darker color.
- (H) Efflorescence, cause and remedy.
- (I) Porosity, cause and remedy.
- (J) Frozen surfaces and frozen body.
- (K) Softness of surface.
- (L) Dusting.

VII. Specifications to obtain all the treatments and results of each sub-heading, No. 1, 2, 3, 4, 5.

VIII. Costs.
Exact and relative cost of each method, and manner of estimating cost of materials and labor.

I. Effect of Material and Workmanship on Surface.

This heading pre-supposes that the surface will be treated in some way so as to remove the surface coat, otherwise the ingredients of the mortar or concrete would make little difference.

(A) Cement.—The color of the surface is largely that of the cement which is used. Although there is some difference in the shade of gray of standard Portland cements, the difference is so slight that with very few exceptions no thought need be given to the color of cement. There are also some white cements on the market which give a very pleasing treatment to the finished surface. Consideration should be given to some extent to seasoning, as a well seasoned cement is less likely to cause cracking or shrinkage cracks than one which is fresh. The subject of fineness of grinding is of less importance but is worthy of some consideration.

(B) Sand.—If the surface is tooled or scrubbed particles of sand will be exposed to view and their color will have an important influence upon that of the surface. Their size will also have an influence upon the texture. A sand with large round grains such as is found on the sea coast in places, the grains being practically of one size, cannot be used in as rich mixtures as sand of variable size and angular grains, because the round grains will rub from the surface with considerable readiness if the mixture is 1 to 2 or leaner, and as the grains in the first named sand are large they have more influence upon the color than sand of variable sizes. The coarse Plum Island sand used in Boston and vicinity has uniform sized grains and is of a yellow color, and work done with it has the appearance of being iron stained. A light gray or white quartz sand will lighten up the color of the mortar very materially so that it would appear that some pigment had been used with the cement. Stone dust makes an excellent sand and when of a grayish color can scarcely be distinguished from that of the cement, thus giving a uniform appearance. Quite a variety of colors and textures can be obtained by care in selecting the sand, either natural or stone dust, of variable sized grains, ranging from that which will pass a 30 mesh sieve to that which would just barely be rejected upon a ¼ in. sieve.

(C) Stone.—The stone, still more than the sand, can be used to vary the appearance of the finished surface on account of its larger size and ease with which it can be cleaned of cement when the latter is still green. It is possible to get a very wide range of colors in stone and one color can be used or two or more can be mixed together and give very pleasing effects, the size ranging from rejection of the ¼ in. sieve to that which would just pass a 2 in. ring. Contrasting the angularity of broken stone with the round and smoother surfaces of gravel, gives effects which are still more varied than with quarry stone, and are just as durable as far as strength and waterproofness are concerned.

(D) Foreign Matter.—It is also possible to get some pleasing effects by the introduction of foreign matter such as broken brick, glass, fragments of metal like copper, brass, even nails are sometimes used, but the rust and stain from the iron nails is unsightly. Sometimes ores, such as the green ore of copper have been used for producing certain effects. Oil, glue, lime have also been introduced at times for certain purposes. In one instance the following mixture was used: To every barrel of cement was added 4 lbs. of salt and 20 lbs. of quicklime slacked for one week, passed through a fine screen, 4 lbs. of lampblack and 1 lb. of linseed oil. In preparing this the lime was first slacked and while yet hot the salt in solution, together with lampblack and oil, were added and all stirred thoroughly together, the mixture then being passed through a fine screen into vats and allowed to stand for one week or longer before using. The proportion of aggregates to the cement was 6 to 1, the stone being a mixture of dark blue trap and white marble.

(E) Water.—Water has its influence on the appearance of the surface in several ways. The amount of water has an influence on the density. When the mixture is quite dry it is impossible to compact materials well, and the resulting mortar or concrete is porous. If a sufficient amount of water is used to produce a plastic mix the appearance is dense and uniform, while a large excess of water brings the fine particles to the surface and produces a little different texture from plastic. Moreover, the quantity of water affects somewhat the time of set of the cement and thereby to some extent the color.

(F) Pigments.—Coloring matter of various kinds can be added to the mixture. Those of a vegetable origin are not permanent because they are likely to be acted upon chemically by the ingredients of the cement. Only mineral colors should be used. The amount which can be safely used is small, owing to the danger of impairing the strength of the resulting mortar. Five per cent by weight to that of the cement should be the limit, beyond which the impairment of strength is too great to justify a larger amount. Even this amount of certain colors which differ little from that of the cement, like yellows and reds, do not produce a marked change from that of the neat cement. Lampblack is the principal ingredient used for darkening, which, on account of its strong contrast and the fineness of its particles produces a strong contrast with a moderate amount. For lightening the color somewhat, lime is the best material to use. Coloring matters can be used in either a dry form or as a paste. It will generally be found most convenient for mixing to use the dry form, thoroughly mixing it with dry mortar before the addition of any water.

(G) Molds.—Molds also have an influence upon the appearance to some extent. With rigid materials like metal or wood there is a tendency for the coarsest particles to come to the surface, and unless this is overcome by spading or proper manipulation the surface is likely to be rough and porous, and if the stone is pushed too far back a mortar face is obtained. With rigid molds which are non-absorbent, the surface is likely to be of a watery appearance, and after hardening will have small holes in its surface where drops of water stood and later evaporated. Porous molds, such as sand or various combinations of sand and other substances, treated or untreated with chemicals, all produce a similar effect, namely, a dense cement surface, as the cement is brought to the surface by the excess water which is absorbed by the molds. However, this type of mold does not remove cement from the mortar and its surface of contact is not bonded to the casting by the excess of cement which comes to the surface. This excess of cement on the surface is liable to cause hair or map cracks, and in large specimens is subject to shrinkage more than with molds of other material. If the mold is not filled by continuous pouring an unsightly line impossible to conceal later is left where work stopped.

(H) Mixing and Placing.—On account of map cracking and shrinking it is not wise to mix mortar richer than one part cement to two parts sand, and for freedom from these two defects it is frequently better to mix it as lean as one to four. Stone in proper proportions can be added to the mortar to get the desired textures. Thorough uniform mixing and quick placing are desirable features. The aggregates should be graded with the utmost care to get a maximum density. A concrete whose surface has to be removed should be so made that it will have an absorption of not more than 5 per cent by weight. These subjects have been so well covered in the past contributions to this association that detailed treatment is here unnecessary.

(I) Treatment While Hardening.—The appearance can be modified somewhat by the treatment of the surface while hardening. If it is allowed to dry rapidly it will be of a lighter color than if kept damp and allowed to dry slowly, also, the former surface will be more dusty than the latter.

II. Removal of Surface in Various Ways.

(A) UNSKILLED LABOR. PICKING, SCRAPING, RUBBING.—A variety of treatment can be given to the surface by the use of unskilled labor. Taking such tools as a hand pick with a single point or a pick with face of two inches with a series of points upon it, the surface may be scaled from the concrete, entirely removing any marks of the mold or any stains from a coating placed upon the surface of the mold to prevent adhesion of the mortar, leaving the surface below of a natural cement color and exposing the sand grains and the stone of which the concrete was composed. The cost varies considerably with the age of the cement when the picking is done. When done at the age of three or four days a laborer can cover four to five times the area he can do when the cement is two or more weeks old. The texture, however, differs. Because a larger amount of material is scaled off when the material is quite green and scaled off to varying depths, and because some particles of stone are chipped out of the surface, the texture is much coarser than when done after the cement has become hard. Under the latter conditions the surface has a fine texture and is quite uniform. A little variety can be obtained by the method in which the blow in picking is applied. By striking a perpendicular blow there is no resulting mark left on the surface by the tool, whereas with a glancing blow lines are left, and these can be made to show all parallel to one another or at various angles, and thus a little variety to the texture can be thereby given.

Another way of treating with unskilled labor is by scrubbing with water and stiff brushes, either bristle or wire brushes, while the mortar is still quite green. This removes the excess cement from the surface, obliterates the marks of the molds, and washes considerable of the cement off the surface of the aggregates, so that they appear cleaner, sometimes as clean as freshly-broken stone, and thereby obtaining a bright and pleasing effect. It is common also, in this method, to use an acid which will attack green cement rapidly and eat it from the surface of the aggregates. This type of treatment is used usually during the first forty-eight hours after the cement has been cast. After this age the cement resists the scrubbing and acid process to such an extent that it becomes expensive, and the best results are not obtained.

Nitric, muriatic and sulphuric acids and soap in various strengths up to the undiluted have been tried, and experience is that these agents are impracticable for the removal of vertical surfaces of *good* concrete thoroughly hardened, the action being so slow and attended with so much difficulty that hammering of one sort or another is cheaper.

Great care must be taken in successive casting to prevent marks showing (after scrubbing) where the new and old work join. The practical operation is to finish casting on some line in the building, although in certain architectural treatments this stratification is not objectionable. When it is proposed to scrub the surface of the concrete before it is more than twenty-four hours old, it is necessary to design the forms specially with the idea of being promptly removed without damage to the rest of the structure. This will usually save lumber, but designing for quick removal will usually add to the labor an amount sufficient to offset this. Moreover, arranging to make possible the removal of forms at certain points of the work does not necessarily get the maximum efficiency from the mixing plant, as the quantity of work may not be such as to run the plant at full efficiency for a day.

Another way of treating flat surfaces is by rubbing with pieces of limestone, water and sand, cutting away the mortar and surface of the stone, so as to expose the full cross section of the stone. This is done when the mortar is three or four days old, and is done only with the softer stones, such as marbles. This type of finish is usually known as terrazzo.

(B) SKILLED LABOR.—The surface of concrete after it has become hard can be cut as natural stone would be cut, but this should be done by men who are experienced in stone cutting, and when treated in this way textures similar in character to those of natural stone can be obtained—in fact, the crandall, bush hammer, tooth tool, chisel and set can be used with such effect that at a short distance the appearance is identical with natural stone.

By cutting the material when green, it is impossible to get sharp corners. The round corners which are common in concrete are generally inartistic and crude in appearance. By allowing the material to become quite hard and using proper care, as sharp corners can be obtained as with natural soft stone such as limestone. It will thus be seen that the results to be accomplished have a controlling influence over methods to be used. In this way additions have been made of concrete to old buildings of natural stone with such a perfect matching of texture and color that it is impossible to tell the difference at a distance of eight feet.

It has been the experience of some engineers that just as cheap results can be obtained from bush hammering by common labor as by skilled. This, however, should be qualified again by the result to be obtained. On large surfaces where a coarse general treatment is desired and where the observer cannot get close to the surface, it can be tooled by common laborers when the material is quite soft. If, however, the observer can come within a few feet of the surface the above described treatment is not as good as cutting by skilled labor after material has become thoroughly set. A treatment which has been used to a limited extent has been splitting blocks which have been cast in a plane so as to obtain a natural fracture, and a similar effect can be obtained by breaking off pieces of the surface by a stone set to obtain a natural fracture. In this manner the natural fracture of stone is more closely imitated, but as the whole general treatment is so unnatural to a cast material it is an inartistic treatment and is not recommended.

Still another way is by cutting in a lathe such objects as columns. After the cement has well set the stone can be cut in two without pulling out from the mortar. Thus the center of the stone can be exposed, which is of large cross section relatively to the sand in the mortar, and a more stony appearance obtained. If the stone itself was capable of taking a polish a fairly smooth treatment can be given it by rubbing it down in a lathe after turning. Mortar itself will not polish.

(C) SAND BLAST.—A finish can be obtained somewhat similar to that of scraping by means of sand blast. It is important to have the right sort of a nozzle, however, for this kind of work, and an exceedingly hard sand must be used, preferably that which has angular grains. A ½-inch diameter nozzle would produce very unsatisfactory results, because if an excess of cement came to the surface at one spot or on an edge as a joint between boards its hardness would resist the cutting of the sand, while softer portions on either side would be removed, thus emphasizing the ridge. Similarly a soft spot formed by a wide crack where the cement all ran out leaving the sand behind would be cut deeper by the large nozzle. Experience has shown that a nozzle not over ⅛ inch in diameter should be used, so that it can be localized on small spots and that it must be held within a few inches of the surface to be cut if there is any variation in the density or hardness of the surface.

This method leaves the stone cleaner than with scrubbing and acid treatments.

Again, the age of the mortar has a large influence upon the cost of the cutting and upon the texture of the surface. Good and economical results can be obtained when the cement is between ten and fourteen days old. It requires a fairly large job to justify the cost of setting up and operating a sand blast plant. Various building cleaning companies have portable outfits which are admirably adapted for this kind of work, which can be obtained in all large cities.

(D) CHEMICAL TREATMENT.—When the surface is chemically treated the materials used are usually commercial hydrochloric or sulphuric acid. The amount of dilution must be determined by experiment and will vary with the age of the concrete. The older the cement the stronger must the solution be. For cement which is about two weeks old ordinary commercial acid should be diluted with three parts of water. When but a few days old a dilution of one part acid to five or six of water will be sufficient. A mixture of the two acids will produce stronger action than the use of one alone. They also produce a vapor which will soften the surface when exposed to it in a confined chamber and permit removal of the surface with very little scrubbing. After the scrubbing is completed great care must be used to remove all traces of acid, otherwise there will be permanent discoloration of the surface.

(F) TOOLS. KIND, QUALITY, TEMPER.—A new type of brush for rubbing or scrubbing green concrete surfaces which has proved very efficient in actual work is composed of ordinary wire mesh, such as fly screen, and is made by clamping together a sufficient number of sheets of wire, all of equal size, so that the exposed or rubbing edge will be at least 4 inches wide. Such a brush has proved much more effective and cheaper than the ordinary wire brush.

(G) EFFECT OF CUTTING ON IMPERMEABILITY.—The waterproofness of concrete depends upon the density of the mortar. In the packing of mortar on surfaces which are to be exposed, greater care is usually taken in producing a dense uniform surface which would show a good appearance than in the packing of the whole mass of materials in the back. Therefore, before cutting, there is usually a dense skin of rich mortar on the surface which is practically impervious to moisture. When this is removed by any process the interior is more likely to absorb moisture than before. In one particular job where the aggregate was composed of coral sand and coral stone which was very porous like cinders or blast furnace slag, after picking the concrete permitted water to drive straight through a 12-inch wall from a driving rain, whereas the wall previous to tooling was practically impervious. With a dense stone and quarts sand, a rich mixture, plastic consistency, well packed, a wall may be as impermeable after treatment as before. These facts are sometimes overlooked and cause unexpected and unpleasant results.

(H) EFFECT OF CUTTING ON DURABILITY.—A wall which will absorb and hold moisture is liable to disintegrate ultimately by the action of frost. If it is impervious to moisture the action of frost is merely an attack upon the surface and is very much slower, being practically the same as on any surface of a solid natural stone. Therefore, in a cold climate, cutting off a skin to expose a porous mass is likely to somewhat impair the durability.

(I) EFFECT OF CUTTING ON COLLECTION OF DIRT.—It is common sense to see that roughening the surface of the cement is going to permit collection of dirt and dust blowing in the streets much faster than a surface which is smooth and dense. However, as dirt and dust is usually so like the color of the cement itself it does not produce an objectionable change, and these very fine particles can lodge in the pores of the concrete and assist in rendering them more impermeable. It is only where smoke is thrown out in large volumes that the smoothness of the surface must be considered to resist a change of color.

(K) PHOTOGRAPHS.

III. Coating Surfaces in Various Ways.

(A) TEXTURE AND CONDITION OF MASONRY SURFACE TO BE COVERED.—Masonry as above used includes brick, terra cotta, natural stone, concrete, mortar and plaster. The covering coat must bond to the solid material of the back, and not to the dust or dirt particles on the surface and should be sufficiently substantial to hold the covering. If it is not substantial and rigid and contains cracks the surface covering is pretty sure to crack over the cracks in the back.

(B) METAL LATH. KINDS, METHOD OF ERECTION.—For outdoor purposes it is best to use galvanized metal lath. There are various kinds, woven, welded, expanded, any of which can be used. That having a large cross section of metal and being heavily coated with galvanizing material is likely to be the most durable, if moisture should penetrate through the plastering to this material. It should be thoroughly tied to furring at intervals not exceeding 16 inches with galvanized wire. The furring should leave sufficient space for the mortar to push through the mesh and clinch without interference from the backing to which the furring is attached.

(C) PREPARATION OF BASE TO OBTAIN A BOND.—The texture should be as rough as possible, with recesses in the surface which will support and key on a coating which is applied, and this surface should be free from dust and dirt which would prevent the bond of union. Before coating the surface the base should be thoroughly saturated with water so as to avoid suction of moisture from the covering coat, which would impair its strength and durability.

(D) MATERIAL. CEMENT, SAND, LIME, PIGMENTS.—Materials used are cement, sand of a quality previously mentioned, also lime and pigments of various kinds and quantity.

(E) MIXING.—The mixing must be thoroughly done and the amount of water used is less than with mortars or concrete packed in molds, as otherwise the mortar would run off the lath.

(F) PLACING.—The first or scratch coat should be composed of one part Portland cement, three parts sand and one-half part hair putty. This hair putty shall consist of long cattle hair or fiber, thoroughly worked into good lime putty. The second coat should be composed of one part Portland cement, two and one-half parts of sand and with not over 5 per cent lime putty. The third or finishing coat to consist of one part Portland cement to two parts of sand, with not more than 5 per cent of lime putty. (To this finishing coat may be added pebbles or other noncombustible material as may be desired to obtain a varation in the finished appearance.) Where a total thickness of not more than one inch is required, it is practicable to apply it in two coats, i. e., omitting the second coat above specified. In all cases, one coat should follow the previous one as soon as it has sufficiently set to allow of so doing. This will guarantee a bond of the two applications. The finished appearance may be varied by the materials used, both as regards color and size, by the mechanical method of applying or finishing, or by a combination of any of these methods.

(G) JOINTS.—Plastered surfaces are more subject to shrinkage cracks than monolithic work because a richer material is used and the thinness of the body of the material has less power to resist stress. Therefore, joints should be allowed at intervals where they will be inconspicuous as possible, because as they are likely to occur anyway and are apt to be irregular in shape and position they are unsightly to the eye. If the surface is troweled smooth they are likely to show in an objectionable way. Unless the surface of the various coats are kept wet there is usually trouble from cracking. Some plasterers say that where the under coat is made lean with mortar and with plenty of lime and hair there is great deal less likelihood of its cracking. Care must also be taken to have a sufficient lap in the lathing; to have the lath well tied together and also to the furring so that there can be no settlement or sagging of the lath or the furring to which the lath is attached. The cracks can be filled with cement or by a pump spraying grout or run over with a tool which will fill them. They are somewhat sure to show on a smooth surface anyway.

(H) WASHES.—Washes of cement or lime can be applied to plastered surfaces which will fill the fine cracks and give a uniform surface to the material. Washes are frequently applied to monolithic surfaces and material cast in molds and form a rather pleasing treatment when carefully and well done. If cement is applied with a brush it is not likely to give a pleasing result but is pretty sure to be streaked and irregular in color and this color is apt to be a muddy yellowish green, rather than the gray of cement. If the wash is made very thick and contains sand and is plastered onto the surface and left in this condition or else lightly troweled with a steel trowel or with wooden float the appearance will be much more uniform and of a natural cement color. This is the most usual treatment given to plain monolithic surfaces, like bridge abutments, foundations and mills in inconspicuous locations.

(I) PAINTS.—Paint, either oil paint or special cement paints containing no oil, can be used to good advantage in painting cement surfaces either monolithic or cast, and will give pleasing appearance. The color is simply as much in the control of the designer as paints used on wood.

(J) ENAMEL.—Enamel paints may be used on cement if there is no opportunity for water or frost to get behind the enamel, which would cause it to peel off. Enamels which are baked upon a surface cannot be used as the process of baking would rehydrate the cement and cause the mortar to crumble.

(K) DURABILITY.—There are examples of plastered surfaces which have lasted for fifteen years and are still in a perfect condition. There are numerous examples of moisture getting behind a plastered surface where this is applied to some solid back, as brick, terra cotta, stone or concrete, freezing and causing the plastered coat to peel. For this reason, plastered coats are not generally considered as durable or as desirable as a surface treatment which is monolithic with the body of the surface treated. If the surface is impermeable to moisture and there is no chance for moisture to get behind the surface from any source, the plastering should be durable. If it thoroughly keys to the face its contraction and expansion will be the same as the base and therefore will not peel, due to an unequal stress between the two materials.

IV. Ornamental Treatment. Possibilities and Limitations of Surface.

(A) CAST CONCRETE.—Concrete can be cast in molds of various kinds with a considerable degree of ornamentation. In order to fill the molds, an excess of mortar is used and the finish is largely that of the mortar, the stone being used in the concrete merely as a filling to reduce the cost. Where the stone is exposed to view it is only possible in ornamental work where the surfaces are fairly plain and large area.

(B) CAST MORTAR.—Ornamental casting is largely confined to mortar. Much sharper detail can be obtained than with concrete, even as sharp corners as are usual with limestone. Where sharp corners are not required and the surface is cut, scrubbed or sand blasted as previously described, colored sands or stone grit can be used to produce pleasing color effects.

(C) PLASTERED MORTAR.—Plastered surfaces can be put on rough backs with good results. This is possible only with a mortar of rather a fine aggregate and therefore cannot give as large a variety of surface textures or colors as the cast, and the ornamental effects are largely those of straight moided members, as in a cornice, which can be run by the plasterer in place. These, however, are cheaper in cost than the cast and for this reason are quite extensively used.

(D) KINDS OF MOLDS.—For rigid molds, wood is chiefly used and ornaments can be cast in any form in which the wood can be molded, except that no undercut work can be done as to remove the wood would break the mortar. When wood is used it must be carefully filled with paint or oil so as to prevent the absorption of moisture from the mortar which would carry with it some of the cement bonding the mortar to the wood and thus destroy the face of the casting when the mold was removed.

Iron molds are used to some extent but are too expensive unless a great many castings are to be made exactly alike, in which case they are economical. It is not economical to make elaborate ornaments with iron molds on account of the expense of the mold. Sometimes stamped sheet metal can be used as a model for the face of the casting, but the appearance is not pleasing and is seldom desirable.

Plaster of Paris is very extensively used and by cutting it into small pieces and putting together can be used for slightly under-cut work. Plaster of Paris molds can be used for quite elaborate castings and for castings containing as much as two or three cubic yards of concrete. As the plaster is not very strong in itself it is reinforced by burlap or some other fibrous material to give it strength. Its surface must be carefully treated to make it non-absorbent to moisture, as otherwise it will be damaged by the material cast in it. Each time a casting is

made the surface must be again prepared to resist the attack of moisture. These molds are rather expensive on account of the high class of labor necessary to make them. It is usually necessary to make a model before the mold can be made.

Where a considerable amount of undercut work is required molds are made of glue. This requires considerable care and skill. The best quality of gelatine glue is required, mixed with the minimum amount of water necessary to dissolve and melt it at a low temperature. Around the model is placed a plaster form to receive the glue, which is poured in about 1½ in. thick between the model and the form. The glue is then cut in sections so that it can be removed from the finished casting, is removed from the model and reassembled. It must be used before it has had time to dry up. Its surface should be coated with lard oil to prevent the absorption of water, which would disintegrate its surface. The lime of the cement also attacks the glue and decomposes it. For these two reasons castings of glue must be made with a minimum amount of moisture. Not more than three castings can be made before the glue will have to be remelted and recast, and after three or at the most four castings it will be so impaired in quality that it must be thrown away and new glue used. However, such undercut work can be done with glue molds that it is frequently necessary to use them.

Sand, either plain or treated with some material such as clay, loam, paraffine or acid, is used for molding purposes. The sand must be fine, so as to hold its shape, like sand used in iron foundries, and can be used for any object from which the pattern can be drawn. In fact, as elaborate objects can be cast in sand as in metal. As the sand can be used over and over again, the expense of its use is determined by elaborateness of the object which determines the amount of labor necessary to make the mold. A very promising departure in concrete molding is the use of sand and paraffine as a molding material. At 150° or above a little paraffine will disseminate itself through a great deal of sand. This sand shows the presence of paraffine very little and can be molded at 110° or thereabouts, i. e., while slightly warm to the touch. Below 90° this material becomes quite rigid, and would seem for concrete casting to be ideal. Molds made of Portland cement and mortar have been used with success on plain work. It is the experience of one company having had years of practice in all kinds of cast work that absorbent molds into which is cast semi-liquid concrete give the most uniform color and texture and produces concrete of 10 per cent to 25 per cent greater density than when tamped, pressed or poured into non-absorbent molds.

V. Waterproofing.

(A) NECESSITY.—With thoroughly well mixed and carefully placed concrete made from materials properly graded for size so as to obtain maximum density with mixtures not exceeding 1-2-4, the resulting concrete would be so impermeable that waterproofing is unnecessary. With leaner mixtures or less care in the grading of materials the concrete will be somewhat porous, rendering necessary in many cases the waterproofing of the surface or in order to prevent penetration of moisture, by waterproofing the mass when it is cast.

(B) MIXED IN CONCRETE.—There are many substances proposed for mixing in the mass of the concrete to render it waterproof. Some of these are trade marked or patented. The committee has made a study of and is familiar with many of these, yet does not feel justified in making a definite statement of fact regarding any of the protected trade substances at this time.

The fundamental principle in the waterproofing of concrete by addition of foreign substances is to introduce some material which is very much finer than the particles of cement that will mechanically fill the voids between the grains of sand and particles of cement, thereby rendering the whole mass denser. One of the most common materials used for this purpose with considerable success is lime. It can be thoroughly slaked and mixed with concrete as a putty, or better, thinned to a whitewash. Another form producing similar results is hydrated lime, which is a common lime slaked, dried and pulverized to a fine powder, and mixed dry into the mortar.

(C) METHOD OF INCORPORATION.—With lime an amount of five per cent by weight to that of the cement will give good results without the impairment of strength in the resulting concrete. If mixed dry it should be carefully sprinkled over the sand and cement and so thoroughly mixed by hand or machine as to obtain a uniform distribution throughout the mass. If mixed wet the putty should be so thinned that it can be as easily and uniformly distributed through the whole mass as is the water.

(D) SURFACE TREATMENT.—There are a large number of trade articles for the surface treatment of concrete, especially of dry blocks, which are practically colorless. The committee is not at this time prepared to make definite statements regarding them and desires most extended discussion and fullest information upon any and all substances. One treatment only can be mentioned at this point, namely, the use of paraffine, which is a staple material of mineral origin. This can be applied to the surface hot with a brush, or what is still better, the surface can first be heated so as to permit the hot paraffine which is later applied to soak to a greater distance into the surface pores before it has time to cool and harden. This material, if used to excess, will give a glossy, oily appearance to the surface. Care should be used to avoid excessive use for this reason.

(E) SURFACE TREATMENT CHANGING COLOR.—This title implies the application to a surface where color is of no consequence, as for instance foundation walls or the like. Here two general types of treatment can be used, those with a membrane substance like felt and those without. The most common substance used is some of the products of asphalt or tar. Their application is more a matter of engineering than surface treatment.

(I) MORTAR.—For many places where a surface must be waterproofed a rich mortar carefully applied by skilled workmen will not only answer the purpose of finished appearance but will resist a water pressure of a number of feet head. It is a treatment which should only be used for good results by experienced and skillful workmen under intelligent supervision.

VI. Limitations, Defects, Blemishes of Various Sorts, and Remedies.

(A) RANGE OF COLORS.—The range of color in mortar by use of pigments is limited to reds, yellows, blue and black. No other satisfactory color has come within the observation of the committee. Red and yellow can only be used as faint tints, as to use them in quantities exceeding five per cent by weight impairs seriously the strength. Blue shades are obtained by small use of lampblack, and black by larger use. The range of color in the aggregate is limited to the colors found in natural stone or other substances as previously mentioned, which is exposed later by the removal of all cement from the surface of these particles of aggregate.

(B) VARIATION OF COLOR.—With the admixture of pigments, unless extremely thorough mixing is used there will be a variation in the color of the mortar. The great difficulty, however, is the variation in color between the different batches, due to a slight error in proportioning, the variation in the quality of the pigments, or the treatment during setting and hardening. Cement setting in a hot dry place will have a lighter shade than those setting slowly in a wet, damp place, even if all other conditions of manufacture are identical. Where the color is obtained from the aggregate, variation is due to a variable distribution through the mass or in placing an excess of stone in one part of the mass over that in another.

(C) CRAZE CRACKS, CHECKING.—This has been one of the most neglected subjects with which the manufacturers and users of cement has had to deal. There is little question that checking is caused by deferential expansion and contraction, but years of continued and vigilant investigation has not furnished data from which definite conclusion as to the real cause of crazing in cement concrete can be obtained. The theory that cement when cured in air contracts and when cured in water expands, advanced by many, does not satisfy all the phenomena which have been observed in experiments. It is quite easy to prove that any concrete, irrespective of cement and aggregate, is never entirely free from crazing. It is well known that the greater the amount of cement the more crazing is obtained, also that careful curing greatly reduces it. With a view to bringing out discussion of this all important subject the committee takes the liberty of appending some of the phenomena observed in experiments, and conclusion reached as follows:

1. That all Portland cement crazes. The denser the concrete the more marked are the craze lines, for the reason that it is the dirt which accumulates in same that makes them so apparent, and as the body of an absorbent concrete absorbs more of this dirt than a dense concrete, but uniformly over its surface. It is only the fact that the dirt collects in the craze cracks that makes them apparent on the denser material.

2. That there is quite often an exudation from cement concrete which collects in craze cracks, which when analyzed is found to contain practically all the constituents of which Portland cement is composed, showing that more or less of this material is absorbent and carried to the surface by the moisture when the concrete dries.

3. Exposure of green concrete to draughts, sun and rain, appreciably increases the amount of checking, but that no matter how carefully concrete is protected or for how long a period, it will eventually craze and check on exposure. This has been proved by curing concrete in water kept at very nearly a constant temperature for a period of two years, and that casts so made when sawed in half thoroughly dried out, and exposed to the air, checked inside of thirty days.

4. That such crazing or checking is not confined entirely to the surface of concrete.

5. That the addition of waterproofing compound does not stop checking, but by the preventing of concrete absorbing dust and dirt prevents it from showing temporarily.

6. That the more thorough the mix, and the more careful the proportioning of the aggregate so as to reduce the amount of cement necessary to make a dense concrete, materially decreases checking.

(D) EXPANSION AND CONTRACTION CRACKS.—Such cracks are due almost entirely to thermal stresses and can be overcome and controlled by proper reinforcement with steel in lengths of concrete up to 500 feet and perhaps longer, but as such would be treated under the subject of concrete design.

(E) IRREGULAR SIZE.—The prevention is stronger bracing of molds; the correction; chipping before or after the work is hard. This is a frequent point for criticism against appearance or concrete. It is not a blemish when the work is well done any more than the mortar joints in brick and stone work. It may be minimized by cutting back the surface of the work before it is hard and grouting on a new one.

(F) MORTAR AND STONE AT HORIZONTAL JOINT BETWEEN DAYS' WORK IN CONCRETE WALL.—In building monolithic walls where work is stopped for the day, an excess of mortar is frequently tamped to the surface and sets. The following day when soft concrete is added an excess of stone settles through the mortar to the hard surface below so that after cutting the surface a line is shown about a half inch wide of mortar with an excess of stone directly above. This is avoided by scraping off a half inch of the surface when the day's work is done before this has had time to set and by care in using a stiff mix in the first batch deposited next day so that the stone is held uniformly distributed in the mortar which is too stiff to permit the stone to settle through it.

(G) PATCHES A DARKER COLOR.—These seem to be caused by using a richer mixture, steel rubbed off from trowel with which applies, less surface evaporation from patches, or bringing to surface by troweling of the dark colored cement particles or the aggregates. It has been conclusively demonstrated that with due care and by addition frequently of some material to lighten the color of material put into a patch, that the patch cannot be detected even after several years of exposure.

(H) EFFLORESCENCE, CAUSE AND REMEDY.—Efflorescence is caused almost exclusively by percolation of moisture through a wall. It is not to be observed where a wall is always dry. Portland cement always contains some free lime and this is brought to the surface in solution by water and left there by its evaporation. This efflorescence has been chemically analyzed and found to be almost pure carbonate of lime. The remedy is to avoid percolation of water through a wall. If this tendency is very slight, as for instance in the wall of a building which is somewhat porous, allowing a driving rain to soak into the surface in such quantities as to later percolate to the surface, bringing with it in solution lime, the appearance of efflorescence can be very much reduced or practically removed by waterproofing the surface with some compound which will prevent all absorption and percolation whatsoever.

(I) POROSITY. CAUSE AND REMEDY.—Porosity is a lack of density; that is not getting enough material into a given compass. The causes may be too little cement to fill the voids, too much fine sand, not enough fine sand (i. e., sand not properly graded), stone not proper size or properly graded for the work, not enough water added to the mixture to lubricate it and feed the cement.

(J) FROZEN SURFACES.—Freezing retards the setting of cement but does not destroy it. If the surface freezes the set is retarded so that the portion behind which is not frozen, setting faster, breaks the bond between the two, causing the frozen portion to scale. The remedy after the surface is frozen where the material lost has not got to be replaced, is to resurface that material which is left. If it must be replaced the texture of the surface originally desired must determine largely the method of treatment. If this be a plastered surface it is a simple matter to roughen up the back to give a key for plaster and to place it on. If it is to be a tooled concrete surface, then a sufficient mass must be removed to enable a new facing to be placed, including aggregate of the same size and proportions as in the original work, in order to build out the face and also to have sufficient strength and stability either to stand by itself or to be properly keyed by suitable methods like the use of reinforcement, to the back.

DUSTING. These troubles are due to soft sand, unsuitable foreign material in sand, too little cement in mixture, bad mixing, too much time elapsing between mixing and finishing, finishing mixtures too dry or too wet, use of "dryers" (i. e., dry cement with or without sand to dry out the surface so that it can be quickly finished), permitting the surface to dry so rapidly so to impair the setting of the cement. When a thin surface is placed on one which has become hard there is liable to be dusting because there is no absorption from the concrete to take care of the excess moisture in the mortar. It has therefore got to come to the surface and in so doing it brings the soluable salts of Portland cement called laitance with it and some of the finest particles of the cement, the impalpable powder, to the surface, both of which are easily brushed off, and thirdly, because the moisture comes to the surface it cannot be troweled as soon as it ought to be, and when it is troweled so long a time has elapsed that the setting of the cement is broken up or impaired, thus materially reducing its strength. The remedy, where color is not an object, is the application of one or two coats of well boiled linseed oil. Paint is sometimes used, but is not a satisfactory material because as a rule it does not harden the dusty surface and the dust prevents its bonding to the mass below so that it scales off, leaving an unattractive appearance. In some cases the top may be ground off as in terazzo work, until a hard surface is obtained.

VII. Specifications.

The following specification is suggested for furring and metal lathing to obtain results of (III-b):

FURRING FOR STEEL FRAME BUILDINGS.

The furring for steel frame buildings shall consist of ¾-in. channels, or 1x1x⅛ in. angles extending in a vertical direction and spaced 16 in. center to center. Horizontal steel girts shall be provided (as part of the structural steel) spaced not over 8 ft. apart, consisting of such shapes that the furring can readily be attached and supported. If the girts are spaced more than 8 ft. apart, the furring shall be proportionately increased in strength.

FURRING ON WOOD FRAME.

The furring over boarding of wood frame shall consist of ¼ in. round or square rods extending in a vertical direction and spaced 16 in. center to center and securely stapled in position. (This furring serves two purposes, viz.:—to support the lath free from the wood, and second, to form a reinforcement for the stucco wall.) In this construction weather boards may be omitted, but this is not desirable. If weather boards are used, building paper should be placed first before furring is applied.

METAL LATH.

The metal lath shall be of sufficient rigidity to readily take mortar when supported by furring spaced 16 in. center to center. For exterior walls, it shall be protected from rusting by being entirely galvanized or treated by any other equally efficient process.

The lath shall be wired to the furring angles or channels every 8 ins. with No. 18 annealed galvanized steel wire or stapled to the wood support every 8 in. (in the length of the furring rods) with staples which are galvanized or otherwise equally protected from rusting.

The following specification, prepared by the state architects' office of the state of New York, and Green & Wicks, architects, Buffalo, N. Y., is used for ornamental work by the state of New York and covers work given under division IV fairly well:

SPECIFICATIONS FOR CAST CEMENT STONE.

All cast stone shall be made of high grade Portland cement, such as will pass the standard specifications of the American Society for Testing materials, and of a brand satisfactory to the architects, and an aggregate of uniform color and texture and free from iron and other foreign material liable to discoloration. Preference will be given to aggregates of marble or granite.

The cement and aggregates shall be thoroughly mixed in a proportion of one part of cement to not over six, nor less than four parts of aggregate, all measured by weight. The aggregate shall be made by crushing selected pieces of stone to insure uniformity of color and texture, and shall be screened into at least three sizes, the largest of which shall not exceed that which passes a ring of one and one-quarter inch in diameter, and the various sizes shall be proportioned for maximum density. There shall be at least fifty per cent of such a size of aggregate that will pass one-quarter inch ring and will not pass a one-sixteenth inch ring.

The concrete for making the cast stone shall be mixed with not less than fifteen per cent of water by weight and shall be mixed by a machine, preferably of the rotary type. If cast in a semi-liquid condition, it shall be continuously agitated up to the time it is deposited in the mold.

All casts shall be properly seasoned by being kept moist and away from the sun's rays and draughts for at least ten days after being made.

After having been seasoned for at least ten days, all exposed plain surfaces of the stone shall be tooled with a drove finish of four or six cuts to the inch as the architects shall specify. This tooling shall preferably be done by grinding the grooves by the use of an abrasive material so that the larger aggregates will not be disturbed or in any way shattered.

All cast stone shall be of such quality that it will pass a test at the age of twenty-eight days of at least 1,200 pounds compression per square inch and shall not have an absorption to exceed five per cent when thoroughly dried and immersed in water for forty-eight hours. All lintels, bearing stones and others subjected to cross bending shall be reinforced by means of steel rods placed about one inch from their tension surface, and the total sectional area of the steel shall be equal to one-half of one per cent of the area of the concrete in the member reinforced. When any casts exceed in any dimension, twelve times its least dimension, it shall be reinforced to insure safety in handling.

Samples of cast stone on which bids are based shall be submitted for approval. Preference shall be given to

stone cast in any established factory. All casts shall be provided with steel bonds for the purpose of tieing into the backing and with hooks for handling and lifting, which shall be placed in the stone while casting.

Cast stone need not be plastered or painted on the back as specified for Indiana limestone.

VIII. Costs.

The cost of unskilled labor for picking or rubbing concrete when six to twenty-four hours old is about one cent a square foot. If two days old, so that fiber brushes and water have to be used the cost runs from two to three cents for actual dressing of the surface. In order to be able to remove the forms to get at the surface at these ages it will have to be designed in such a way that its price may vary from nothing to five cents a square foot.

For a special facing material of an inch thick of one cement, one and one-half sand and two and one-half of fine crushed stone or pebbles, placed at the same time with a coarse backing in the walls, will add about three and one-half cents per square foot to the cost of the surface. This cost is independent of the method of treating the surface later.

Tooling by multiple picks by common labor when the surface is green will cost from three to four cents per square foot; when hard, from five to ten cents.

The cost of the use of pneumatic tools varies materially with the size of the job and to what extent the work is scattered. For long low walls pneumatic tools will cost more than hand. For large areas like the soffit of a big arch pneumatic tools will be cheaper than hand work by one-half to one-third.

Sand blasting when the cement is one to two weeks old will cost about the same as bush hammering; when older it will cost considerably more.

Extended experience gives the following cost data: For hand tooled cast concrete four or six grooves to the inch with steel tools, the cost on a contract of tooling some 10,000 sq. ft., with skilled labor, was fifteen cents per sq. ft.; the same kind of tooling with pneumatic tools about twelve cents; the same tooling done in a factory by grinding with a special designed machine, one cent. This special designed machine consists of cutting wheels suspended on an arm like a pendulum woodworking saw revolved at a high rate of speed, so that concrete of almost any age could be cut without disturbing the stone in the aggregate. The cost of crandailing, being an average of many jobs, with skilled labor, is about ten cents; with unskilled, about five cents.

SPRINGFIELD CONCRETE NEWS.

Springfield, Ill., Sept., 20.—The Litchfield-Hillsboro Chautauqua Association will construct a concrete dam on its property near the two Illinois cities from which the assembly gets its name.

J. J. O'Hern & Co. of Chicago, are building the concrete abutments for the Chicago & Northwestern Railroad bridge near Stone Station, on the Peoria and Sterling division. F. E. Ramsdell of Sterling, is inspector of concrete and bridge work for the railroad company.

The East Moline Automobile Company will have the entire surface of its testing track, a quarter of a mile long and sixteen feet wide, covered with concrete. The contract for the work has been let to H. W. Horst of Rock Island.

John P. Bly, of Fulton, is busy with his cement block factory and is shipping much of his product to nearby towns.

The Western States Fence and Tile Company of Paris has been re-organized. The new officers are: President, S. Con Hogue; first vice president, George V. Doie; second vice president, W. M. Hodge; secretary and treasurer, Charles S. Levings. Following are the directors: James T. Oads, William H. Hodge, Oren E. Manning, W. C. Grant, Charles W. Israel, Charles S. Leving, E. E. Gregg and the officers of the company. Among the specialties of the company will be concrete tile ranging in size from 4 to 36 inches. Concrete fence posts will be another well-advertised product. S. Con Hogue has been chosen as general manager, and O. V. Meyers of Hume, Ill., will be in charge of the sales and publicity departments. The capital stock of the company is $50,000.00.

The contract for the reinforced concrete work on the Sovereign building at Rockford has been sublet to William P. McEvoy & Co., of Chicago.

Harry Holmes, of Macomb, will build the concrete dam across Crooked Creek for the city of Macomb.

Four big concrete arches will form a prominent part in the plans of the Big Four Railroad for replacing the trestle work bridge across Kickapoo Creek near Downs. This work will cost in the neighborhood of $30,000.00, and A. J. Yauger, of Pekin, who has the contract, already has begun work.

Seventy blocks of new walk are called for in ordinances passed at Moline.

In the last three years $10,184.55 has been spent for concrete-steel bridges in Manhattan township, Will county. This is a good example of the increased use of concrete in spans for rural highways in Illinois.

Wolcott & Jones, succeeding Geiss & Jones, at Batavia, will manufacture concrete. They have secured twenty acres of land which is rich in gravel, sand and stone. They also will become contractors for general concrete and sidewalk work.

Peoria considers ten miles of cement sidewalks as an improvement for Adams street.

Tarbox & McCall, Findlay, O., are making concrete drainage tile at their new plant.

CLEVELAND CONCRETE NEWS.

Cleveland, O., Sept. 15.—During the past month contracts have been let for a number of new concrete structures in and about Cleveland. This type of building has sprung into unusual prominence during the past two or three years and an immense amount of it has been started and is now under way.

One of the large contracts let during the month was for the superstructure for the new twelve story Athletic club building. It went to the W. B. McAllister Co. of Cleveland. The building was designed by J. Milton Dyer, also of Cleveland. It will be novel in as much as a large swimming tank, the largest in the middle west, will be located on the twelfth floor. On the roof will be a finely appointed roof garden. The exterior will be of glazed terra cotta with the structural work of concrete.

Concrete is to be used in the eight story addition to the New Amsterdam apartment hotel, which is to cost about $80,000.00 completed. During the past week the concrete structural work was let to the F-P. Construction Co. of Cleveland. The building, which will be 40′ x 180′, was designed by George H. Steffens. The F-P. Co. has just completed work on an eight story concrete building for the Tenbusch Realty Co. on E. Fourth street near Prospect avenue.

Courtenay & Emerson, concrete engineers, have completed plans for a new manufacturing plant on E. Seventy-sixth street for the Globe Machine & Stamping Co. Contracts are to be let during the present month and work started at once.

The Osborn Engineering Company of Cleveland has been erecting many concrete factory buildings during the past summer, especially for several of the large rubber companies at Akron. One of the latest to be announced is for the Republic Rubber Co. It will be a large five story fire proof structure of concrete, 80 x 300 feet in size. The general contract has been let to the Reaugh Construction Co. of Cleveland.

Early in October the new Rocky River bridge, built of solidly reinforced concrete and having the longest concrete arch in the world, 280 feet in length, will be completed and formally dedicated. The bridge is 710 feet long and rises nearly 100 feet above the surface of the water. It was designed by county engineers and has been in course of erection for the past two years by the Schillinger Brothers Company of Toledo, costing $208,000.00.

An evidence of the sort of thing which brings concrete engineering into disrepute has just been given in the report of the Ohio state engineer of public works who declares that hundreds of thousands of dollars worth of concrete work, made during the attempted rehabilitation of the Ohio & Erie canal is rotten to the core and will have to be rebuilt almost in its entirety if the canal is to be of practical use. It appears that specifications were played with, walls not built to their required thickness, and proper ingredients not placed in the concrete, with the result that much of it crumbles under the stroke of a hammer or crowbar. A state wide investigation of graft in the engineers department is now under way and promises some interesting revelations.

TWIN CITIES CONCRETE NEWS.

Minneapolis, Minn., Sept. 19.—It is interesting to note that reinforced concrete construction is getting its full share of all the larger work being done this season in the Twin Cities and the Northwest. Of the larger buildings built, reinforced concrete has entered into the bulk of them.

William Pierce Cowles, consulting engineer of Minneapolis, was granted patents on his system of reinforced concrete construction on August 30, the patent number being 969,039. The system is described as a capital or mushroom system, with rods crossed in every direction, thereby providing a flat slab which does away with the T-beams which have been in use. A system of tying the succeeding floors, each to the one above, provides a more rigid and substantial structure. A set of five claims was granted in the patent, covering the use of compression and tension members, telescoping rods and a mushroom basket. Mr. Cowles has sold the patent to the Leonard Construction Co., of Chicago, reserving to himself the right to use the system either as an engineer or as a contractor. Mr. Cowles has had his application pending for the patent for something over a year, and during the time has used his form of construction in a number of buildings in the Northwest, among them being the Moore & Scriver building on Upper Nicollet avenue, Minneapolis.

Gilbert Mahoney and Frank A. Rounds, of LeRoy, Minn., have devised a new form of reinforced concrete culvert, which is cast in matched panels and is set up on the site of the work. They claim for it the advantage of allowing for ground heaving in time of frost. The side blocks have a wider base, to give a better bearing surface. The culvert is designed to be set upon a flat foundation bed of concrete. The top block is grooved or corner beveled to set firm upon the side blocks. In cities and villages the culvert may serve for a street crossing as well as a culvert.

W. D. Wise, of Detroit, Minn., has devised a new form of concrete mixer, which mixes all aggregates dry. An automatic feed gives a mechanical exactness to the measuring, which does away with the necessity of checking in the material. The machine is continuous and has either an automatic delivery or it may be discharged at the will of the operator.

The Minnesota State Fair held its annual exhibit the week of September 5-10. The Universal Portland Cement Co., the Chicago Portland Cement Co., the Medium Hollow Block Co., of Minneapolis, and others in cement lines, had exhibits which attracted a great deal of attention. The Universal showing was its miniature farm with all fittings and buildings of concrete.

The largest job of some time in the Twin Cities is the rebuilding of the burned structure which was occupied by the Great Northern Implement Co., at Seventh avenue South and Third street, Minneapolis. The burned structure was brick walls with interior of mill construction, and the fire cleaned it out thoroughly. The owner, A. W. Wright, of Alma, Mich., coöperating with the Great Northern Implement Co., lessee, decided to rebuild of fireproof construction, and selected reinforced concrete throughout, with brick walls. The structure will be eight stories high, about 164x132 feet in size, and will cost complete $200,000.00. The H. N. Leighton Co., of Minneapolis, was awarded the general contract and has started work.

J. H. Nickel, of St. Paul, has the contract for the erection of a reinforced concrete livery stable building at Third and Franklin streets, St. Paul, for the Schroeder Livery Co. It will be one story on one side and five stories on the other, of irregular shape. Cost $30,000.00

The J. & W. A. Elliott Company has the foundations completed and the first story walls part way up for the new west branch library building at Twenty-ninth street and Hennepin avenue, Minneapolis. It will be of brick, stone and reinforced concrete construction. Cost $40,000.00.

Brown & Zenz, of Minneapolis, have the concrete floors in and the brick side walls under way for the grocery building at Hennepin and Franklin avenues for the Holman-Gerdes Company. The building will be three stories, brick. Cost $30,000.00.

August Cedar-Strand, of Minneapolis, has been awarded the contract to erect a reinforced concrete addition to the warehouse of the Boyd Transfer & Storage Co., of Minneapolis, at Lake street and Fourth avenue South. Cost about $60,000.00.

Pike & Cook, of Minneapolis, are pushing work on the construction of a brick and reinforced combined church and parochial school for the Church of the Incarnation (Roman Catholic) at Thirty-eighth street and Pleasant avenue. It will be two stories, 69x120 feet, and will cost $50,000.00. Bertrand & Chamberlin are the architects.

The Walter L. Badger building at 37 to 41 South Seventh street, Minneapolis, a reinforced concrete structure, which was planned for three stories, has been changed and will be made five stories. The contract with the J. &. W. A. Elliott Co. has been changed to allow for the two additional stories, the cost being increased by $15,000.

C. E. Bell, Tyrie & Chapman, architects, of Minneapolis, have plans in preparation for a brick and reinforced concrete factory building for the American Brake Shoe & Foundry Co., to be erected in Minneapolis. It will be 40′x80′.

NEW COMPANY FORMED.

An association has been formed in Brooklyn for the manufacture of concrete machinery and concrete blocks. The company, which is known as the Oliver Concrete Machinery Co., has a capital of $35,000.00, all paid in, and the following officers have been elected: President, E. J. Ennis; vice president, Charles Atkinson; secretary-treasurer, Eber F. Horning. Nine directors were chosen as follows: Willis Crego, W. C. Nixon, C. A. Rimbolt, Charles Atkinson, E. D. Francisco, P. B. Miles, Joseph Scudder, D. J. Boyce, and E. J. Ennis. The company will handle the patents of P. B. Miles relating to concrete machinery and cement block machines. A number of orders are already on file.

Iven J. Hoyt has opened up a cement plant at Watseka, Ill., and will also make bricks.

The Reinforced Concrete Co. has been incorporated at St. Joseph, Mo., with $10,000.00 capital stock by John Gilligan, John L. Zeidler, W. S. McLucas and others.

Lime

The National Lime Manufacturers' Association

Meets Semi-Annually.

William E. Carson, Riverton, Va.....President
A. Newton, Chicago.....First Vice-President
F. M. Palmer, Jr., New York.....Second Vice-President
F. P. Hunkins, St. Louis.....Third Vice-President
C. W. S. Cobb, St. Louis.....Treasurer

Official Organ, ROCK PRODUCTS.

BIG HUNTINGTON MILL RUNNING.

The New lime plant of the Ohio and Western Lime Company at Huntington, Ind., has been completed and is now in full operation. Peter Martin, president of the big lime manufacturing establishment, regards this new plant as being just about as near perfection as is possible to be obtained. In connection with the plant is one of the largest hydrating mills in existence. It is of the Kritzer system, having all the latest improvements. This plant is located in the exact center of the great Niagara formation of lime rock which forms the southern buttress of the great lakes, and it is at its best in this quarry, being about a perfect dolomite. Huntington lime and Huntington hydrate are well known and in discriminating demand to a very wide market.

LIME BUSINESS ACTIVE.

Cleveland, O., Sept. 15.—The Kelley Island Lime & Transport Company, with its headquarters in the Rockefeller building, this city, reports the lime business to be exceedingly active at present. The plants of the company are being rushed to capacity to turn out enough stock to meet orders. Hundreds of buildings have been inclosed, or are being inclosed, before the cold weather sets in and large amounts of lime and plaster are being called for.

The company has decided to enlarge its equipment by the erection of new, large mill buildings, one at Marblehead, O., and the other at White Rock, O. The plans for these structures were prepared by the Courteny & Emerson Company, of Cleveland. The buildings will be of steel construction, one being 80 by 150 feet in size, and the other 75 by 364 feet in size. Operations have been started by the owners on these new structures.

THE SOUTHERN WHITE LIME CORPORATION.

The Southern White Lime Corporation, of Spring City, Tenn., have a capacity of 1,000 barrels of lime per day. They also operate a rock crusher and have extensive timber interests. They also operate a smaller plant, manufacturing lime at Crab Orchard, Tenn., where 300 barrels of lime are daily turned out. This concern has the largest output of lime in the South. Snow Drift brand is manufactured at Spring City, Tenn. Peerless brand at Crab Orchard, Tenn. E. Scott Miles is secretary and treasurer of the company.

There has been a scarcity of lime in the city of Sterling, Ill., the past month which has seriously interfered with building operations. There has been an unusually heavy demand for lime during the summer.

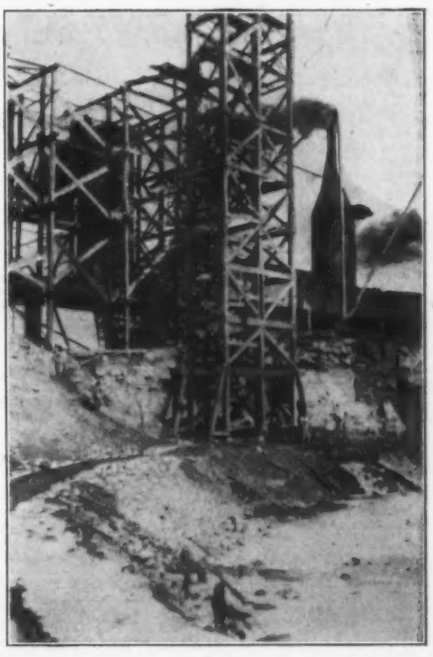
The Leesburg Lime Company, Leesburg, Va., recently incorporated with a capital stock of $50,000.00, will develop five acres of limestone land, daily output to be 100 tons. E. D. White is president of the company.

Louis F. Davison, Harrisonburg, Va., wants to correspond with manufacturers of lime kilns.

The Capital Lime and Stone Company, Columbus, O., has changed its capital stock to $75,000.00 common, and $50,000.00 7 per cent bonds.

HYDRATING PLANT COMPLETE.

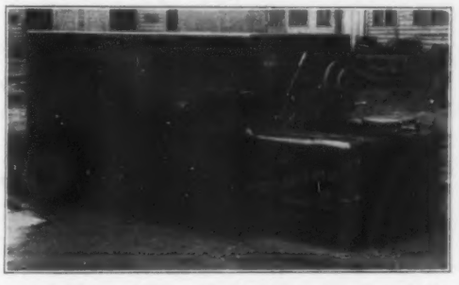
St. Louis, Mo., Sept. 19.—Secretary Healey, of the Glencoe Lime & Cement Company, says their hydrating lime plant is practically completed and the product will be put on the market this month. The Kritzer process, which is now in use from the Atlantic to the Pacific coast, will now be introduced in a vigorous way in this section of the country. The Urschel Bates Valve Bag Company's machine has been installed in the packing department. The Raymond Brothers' Company's pulverizers and the Stephens-Adamson Manufacturing Company's screens also were put in. Mr. Healey states they recently purchased, through the company's agents, R. P. Papin & Co., the Milwaukee Locomotive Manufacturing Company's gasoline motor engine for switching and hauling work at their Glencoe plant. It is a 25 horse-power and weighs about 7,000 pounds, has four cylinder water coolers and can haul four and one-half tons up a five per cent grade.



IMPROVEMENTS IN PROGRESS AT PLANT OF GLENCOE LIME AND CEMENT CO.

LOUISVILLE LIME NEWS.

Louisville, Ky., Sept. 20.—Lime manufacturers in this vicinity are selling about the normal amount of material for building purposes, but they are experiencing what amounts almost to a boom in connection with sales of lime for use in agriculture. While lime cannot altogether replace commercial fertilizers now employed, it is frequently necessary to use it in order to put land in a normal condition after a great deal of phosphate has been used in it.



GASOLINE MOTOR AT PLANT OF THE GLENCOE LIME & CEMENT COMPANY.

Frequently, following treatment with phosphates, which usually contain some free sulphuric acid, the land becomes sour, and will no longer produce clover or other similar legumes. Red-topped clover comes up, and this is a danger signal, showing that sulphuric acid in the fertilizer has had a bad effect. Lime can then be employed to advantage to counteract this, as it combines chemically with the sulphuric acid, producing not only a harmless, but positively a beneficial calcium salt.

Heretofore local lime manufacturers have disposed of their waste product for fertilizer, this containing a considerable amount of cinder. The carbon in this residue proved to be advantageous, and so it is suggested that even if the demand for lime for fertilizing purposes becomes so large that the waste lime will no longer be sufficient, it would be a good idea to put ash or some other carbon deposit in the lime.

To show what a good advertisement a good proposition is in itself, Henry Gray, of J. B. Speed & Co., related an incident connected with the sale of a carload of lime to a farmer down on the Louisville & Nashville railroad. The lime worked well, apparently, and since then there has been a steady and growing demand from that immediate region, showing that the good example of the first buyer had spread to his neighbors.

The Union Cement & Lime Company is operating its lime plant at Salem, Ind., to capacity, and reported a good demand for lime, although nothing abnormally large. John L. Wheat, head of the company, looks for a good fall, as a lot of buildings have reached the stage where they require it.

WEST COAST LIME NEWS.

San Francisco, Cal., Sept. 17.—W. S. McLean, of the Holmes Lime Company, says: "We have had an unprecedented demand for our Diamond brand lime, for plastering purposes. This is an exceptionally high-grade product, made from a white crystal rock. Aside from local orders we are making heavy shipments to the interior, and also getting considerable export business. Hydrated lime is still in active demand, the greatest demand for this material being for use in reinforced concrete construction, for the purpose of making it waterproof. A considerable tonnage is also being supplied to California agriculturists for fertilizing and spraying purposes."

Some of the Pacific coast lime manufacturers have been compelled to make a change in the packages used within the last year or so. Some of the northern manufacturers are using a two-stave barrel made by a patent process, while several of those operating in California use barrels roughly made from materials convenient to the kilns. In former years, however, some of the manufacturers, especially in the southern part of the state, secured material for their packages from the barrels in which cement was imported. For some time the importations have been decreasing, owing to the advances made by local cement mills, until it has become practically impossible to get lime packages from this source. Shippers of lime have accordingly been compelled to look around for other packages, and some of them are having a good many barrels made at the cooperage shops of San Francisco and Los Angeles.

A new kiln has been installed at the Pacific Lime and Plaster Works, near Sonora, Cal., and it is announced that another will soon be constructed.

A. J. Reardon, of San Francisco, is preparing to start a lime kiln at Chehalis, Wash.

It is announced that the International Lime Company, of Seattle, will install a $75,000 lime plant near Sumas, Wash.

NEW PLANT IN OREGON.

Portland, Ore., Sept. 15.—Robert S. Edwards, 603 Worcester Building, Portland, Ore., is engineering the construction of a three-kiln lime plant, as well as a plaster plant, for the Western Lime & Plaster Company, of this city, the plants being located at Lime, Ore. It will be one of the most up-to-date lime burning plants in the Northwest.

The lime operations at Whitehall by the East Butte Copper Mining Company, Butte, Mont., will be temporarily suspended on account of a recent fire which destroyed the plant. Buildings and machinery will be replaced. Damage amounts to $10,000.00.

William Hogan has erected a new lime kiln at Fish Creek, Wis., in connection with the stone quarry which he has been operating for some time.

BIRMINGHAM PLASTER NEWS.

Birmingham, Ala., Sept. 20.—The plaster business in this city is good. Many buildings are in the process of being plastered and as a result most of the workers in this line are busy.

Among the important buildings being plastered at the present time are the J. B. Cunningham school and the Bank of Corey building.

COMPARATIVE TESTS OF LIME MORTAR BOTH IN TENSION AND COMPRESSION—HYDRATED LIME AND SAND—LUMP LIME AND SAND—CEMENT, LIME AND SAND.

BY E. W. LAZELL, PH. D.*

Lime mortar has been used for ages in building construction. The ancient builders were skilled in its use, as is evidenced by the numerous ruins of their works still in existence. The Romans especially became skillful in the use of lime mortars, and further, were familiar with the hydraulic properties imparted to lime by the addition of puzzolanic materials, such as the volcanic ash found in the vicinity of Rome. The endurance of this particular mortar is attested by the examples of Roman construction to be seen in a good state of preservation even today, after having been exposed to the elements for centuries.

Attention is often called to the superiority of the construction work accomplished by the ancient builders as compared to that done in modern times. It must be remembered, however, that their skill is only judged today from the best examples of their work, since it is only these which have survived to the present, the greater part of their work having been destroyed by the ravages of time. In general those buildings and monuments which have survived, owe their preservation to the good quality of the materials of construction used, their actual location having been fortunately convenient to a source of good building materials, such as stone, sand and lime.

The science of the testing of the materials of construction to determine their strength, durability and fitness for the work desired is modern, and one to which this society devotes its energies. In spite of the large use of lime mortar as a material of construction, there is but little serviceable data available regarding the quality of the different mixtures, and their actual strength in ordinary use. It was with the desire to contribute some little information on this score with regard to lime mortars that this paper was prepared.

The object of this investigation was to determine the relative strength of mortars made from various limes in common use in the New York city market. The tests cover both plain lime mortars and cement-lime mortars. The limes used were such as are found in the market in two forms, that is, as lump lime and as hydrated lime. The samples employed for the tests were all produced in the New York market in bag or barrel lots, and were obtained by Prof. Ira H. Woolson, of Columbia university, under whose direction all tests were made.

Before describing the results in full, it will be well to call attention to the difference in the processes of hardening as evidenced in cement mortars and in lime mortars. Cement mortars harden by chemically combining with water, and thereby forming the binding material which holds the sand grains together. Lime mortars harden first by simply drying out. The lime paste, which is a tenacious and sticky substance, surrounds the sand grains, and the first hardening or setting is simply due to the loss of water by evaporation, which produces a mechanical bond. In the course of time the lime combines with the carbonic acid of the atmosphere, thus forming a stronger bond, and the amount of bonding the material and the strength of the bond will increase until such time as all of the lime present has been changed into the form of carbonate.

Character of Limes Used.

A. L. (on the chart) was a lime made from a very pure dolomitic limestone. This lime contained about 55.2 per cent of CaO, 38.0 per cent of MgO and 1.5 per cent of impurities.

A. H. was the hydrate prepared from A. L.

B. L. was a lime made from high calcium lime rock. This lime contained 94 per cent of CaO, less than 1 per cent of MgO and about 2 per cent of impurities. B. H. was the hydrate prepared from this lime. C. L. was a lime made from high calcium lime rock. This lime contained about 95½ per cent of CaO, 2¼ per cent of MgO and about .80 impurities.

C. H. was the hydrate prepared from C. L.

It will be seen that the above limes represent three classes:

1. Pure dolomitic limestone.
2. A high calcium limestone containing about 2 per cent of impurities.
3. A high calcium limestone containing less than 1 per cent of impurities.

The various hydrates were all made for commercial use by their respective manufacturers at the same points at which the limes used were burned.

* Paper read before the American Society for testing materials.

Preparation of the Test Pieces.

In order that the test pieces might be as nearly alike as possible they were all made by one man. This man has had twenty years' experience in cement testing, and is considered an expert at his work.

All proportions were made by weight. Ottawa sand was used in all test pieces. The unit weight of lime was based on the materials as received, and the briquettes made from the quicklime contained one part by weight of quicklime to three parts by weight of sand. The briquettes made from hydrated lime contained one part by weight of hydrated lime to three parts by weight of sand. It is therefore obvious that the test pieces made from the quicklime contained a relatively higher per cent of lime than those made from the corresponding hydrated lime, since the hydrated lime already contained the amount of water necessary to chemically satisfy the lime.

The lump lime and sand were slacked together with the requisite amount of water twenty-four hours before using, this being the common practice in preparing mortar in New York. The amount of water used in slacking was determined by a number of experiments, and it varied with each class of quicklime used. There may be some doubt as to whether the results secured are as good as would have been obtained from a longer period of ageing. They do, however, represent the strength of mortars as commonly prepared from quicklime.

Tension Tests.

Tension tests were made on standard briquettes at periods of twenty-eight days, three months and twelve months. Three briquettes of each mixture were tested at each period.

Compression Tests.

Compression tests were made upon both halves of each briquette previously tested in tension. As a check upon these compression tests a single compression test was made upon small prisms, 1x1x1½ inches, made from each mixture. It was found very difficult to remove these prisms from the moulds in perfect condition, and as a result many of these test pieces were more or less defective. All that were really bad were, however, discarded.

It should be borne in mind that some of the compression tests on the half briquettes were unreliable, because of the rough and rounded surfaces of the top side of the briquettes where it was scraped off in the mould. It was not possible to face these briquettes with plaster, as is ordinarily done with compression tests on brick and concrete, because this would have spoiled the tests. The specimens were therefore well padded with blotting paper and dependence placed upon the number of tests of each kind to average up the irregularities.

I am aware that there may be some criticism of the use of half briquettes resulting from the tension test for the compression tests. When the tests were first undertaken four-inch cubes were used. These, however, hardened very slowly because the surface exposed to the action of the atmosphere or for the absorption of carbon dioxide was small compared to the mass of the cube. Results obtained were very favorable.

Small cubes and prisms were tried, but these were difficult to remove from the moulds in good condition. It therefore seemed advisable to make use of the half briquette, thereby greatly reducing the number of test pieces required, and the cost of the investigation.

While the area of the surface in the compression in the case of half briquettes is large compared with the depth of the specimen, thus not giving the true compression strength, it should be borne in mind that correspondingly in actual practice the joints in brick work are narrow and thin, resembling thin plates, to which the compression is applied on the flat side.

As was to be expected, the specimens made with mixtures which were rich in quicklime were more or less defective, due to cracks in them. A large number of extra specimens, however, were made up, and in most cases it was possible to obtain full sets for each series. All specimens were removed from the moulds as soon as sufficiently hard and were stored in air in the basement of the laboratory. After the briquettes were removed from the moulds they were dipped in water for about two minutes every other day for two weeks, and afterwards they were dipped in water for three minutes once a week. The briquettes were thoroughly dried before being tested.

Results of the Tests.

The results obtained have been plotted as curves, the vertical height representing the strength in pounds per square inch, and the horizontal distance representing the time. In all the charts the solid lines represent the results obtained from the hydrate mixtures. The broken lines represent the results obtained from the quicklime mixtures.

Chart No. 1 shows the results of the tension tests of briquettes made of one part quicklime, or one part hydrated lime and three parts of sand.

Chart No. 2 shows results of the tension tests obtained from briquettes made up in proportions of one part of quicklime or one part of hydrated lime to five parts of sand.

Charts No. 3 and No. 4 show the results of one to three mixtures in which a portion of the lime has been replaced with Portland cement.

Chart No. 5 shows the results of one to five mixtures in which a part of the lime has been replaced with Portland cement.

Chart No. 6 shows results of the compression test on one to three mixtures.

Chart No. 7 shows results of the compression tests on one to five mixtures.

Charts No. 8 and 9 show results of the compression test on one to three mixtures, in which part of the lime has been replaced with Portland cement.

Chart No. 10 shows the results of one to five mixtures in which part of the lime has been replaced with Portland cement.

The use of straight Portland cement mortars for brick work cannot be recommended for general practice because of their lack of plasticity, which prevents the bricklayer from making a good joint and bedding the bricks thoroughly and evenly. In fact, for this very reason it is customary where Portland cement mortar is specified to add a gauging of lime to improve the spreading quality of the mortar. The same principle applies to stuccos or plaster containing Portland cement. To obtain the best results lime should be used in order that the stucco may be spread with less labor, and a good clinch through the lath be assured. The results shown on the chart demonstrate that the lime cement mortars possess good strength. This is made particularly obvious by the showing at the one-year period.

A study of this series of tests and of the charts presenting these results in visible form suggests two most interesting and significant conclusions:

1. That all lime mortars, whether they contain Port-

Table No. 1—Tension Tests, 1 to 3 Mixtures.

1 Part Lime, 3 Parts Sand, Lbs. per Sq. In.
(See Chart No. 1.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	56.5	88	28	91	27	62
3 months	60	90	35.3	116	32.5	90
12 months	125.0	130	72	142	42.0	103

1 Part (.50 Cement .50 Lime) 3 Sand.
(See Chart No. 3.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	132	186	81	154	98	188
3 months	171.5	281	89.5	203	122	190
12 months	241	355	150	247	130	200

1 Part (.85 Cement .15 Lime) 3 Sand.
(See Chart No. 4.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	243	411	351.5	351.7	270	333
3 months	344.5	410	337	430	376.5	358.5
12 months	514.0	537	529	525	463	489

Table No. 2—Compression Tests, 1 to 3 Mixtures.

1 Part Lime, 3 Parts Sand.
(See Chart No. 6.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	368	277	139	167	187	187
3 months	350	530	137	889	110	613
12 months	357	1,035	295	917	168	568

1 Part (.50 Cement .50 Lime) 3 Sand.
(See Chart No. 8.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	905	1,135	648	877	562	559
3 months	1,169	1,508	758	1,162	592	726
12 months	2,710	2,835	1,644	2,181	1,158	1,331

1 Part (.85 Cement .15 Lime) 3 Sand.
(See Chart No. 9.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	1,752	1,716	2,140	2,730	2,107	2,064
3 months	2,537	2,488	2,531	3,375	2,303	2,567
12 months	4,220	4,121	3,927	4,980	3,858	3,688

Table No. 3—Tension Tests, 1 to 3 Mixtures.

1 Part Lime, 5 Parts Sand, Lbs. per Sq. In.
(See Chart No. 2.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	51	27	26	52	24	29
3 months	72	57	47	77	26	46
12 months	124	123	46	102	31	55

1 Part (.65 Cement .35 Lime) 5 Sand.
(See Chart No. 5.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	94	228	62	198	140	215
3 months	114	348	70	274	151	320
12 months	231	328	133	220	117	182

Table No. 4—Compression Tests, 1 to 5 Mixtures.

1 Part Lime, 5 Parts Sand.
(See Chart No. 7.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	178	191	130	204	56	132
3 months	260	310	141	361	50	277
12 months	598	727	324	624	178	343

1 Part (.65 Cement .35 Lime) 5 Sand.
(See Chart No. 10.)

	A. L.	A. H.	B. L.	B. H.	C. L.	C. H.
28 days	534	1,327	463	1,539	545	1,160
3 months	737	2,044	526	1,930	662	1,428
12 months	1,733	3,578	941	3,551	1,591	2,877

Tension Tests Average, 1 to 3 Mixture.

(See Chart No. 11.)

	.85 Cement, .15 Lime, 3 Sand.		.50 Cement, .50 Lime, 3 Sand.		1 Lime, 3 Sand.	
	Quicklime.	Hydrate.	Quicklime.	Hydrate.	Quicklime.	Hydrate.
28 days	288	365	103	176	37	83
3 months	352	399	127	225	43	99
12 months	502	517	174	267	81	125

Compression Tests Average, 1 to 3 Mixture.

(See Chart No. 12.)

	.85 Cement, .15 Lime, 3 Sand.		.50 Cement, .50 Lime, 3 Sand.		1 Lime, 3 Sand.	
	Quicklime.	Hydrate.	Quicklime.	Hydrate.	Quicklime.	Hydrate.
28 days	1,999	2,170	704	858	239	210
3 months	2,451	2,810	859	1,132	199	577
12 months	4,001	4,263	1,837	2,116	273	840

Tension Tests Average, 1 to 3 Mixture.

(See Chart No. 13.)

	.65 Cement, .35 Lime. 5 Sand.		1 Lime, 5 Sand.	
	Quicklime.	Hydrate.	Quicklime.	Hydrate
28 days	99	214	33	36
3 months	112	316	48	69
12 months	160	277	67	93

Compression Tests Average, 1 to 3 Mixture.

(See Chart No. 14.)

	.65 Cement, .35 Lime. 5 Sand.		1 Lime, 5 Sand.	
	Quicklime.	Hydrate.	Quicklime.	Hydrate.
28 days	574	1,339	126	176
3 months	642	1,801	150	316
12 months	1,422	3,338	343	568

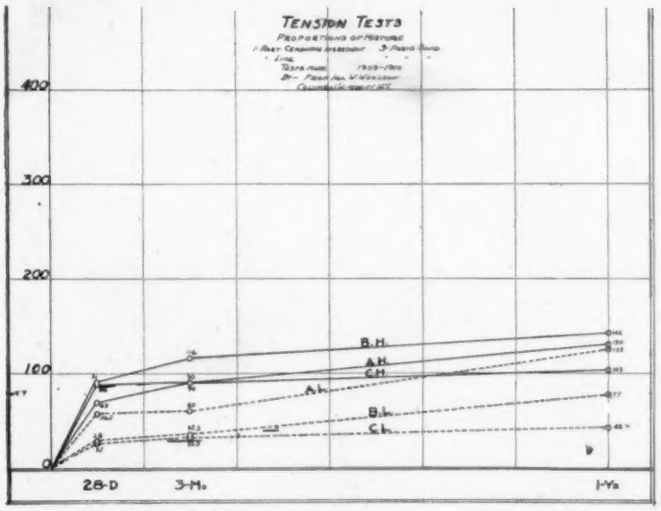


CHART NO. 1.

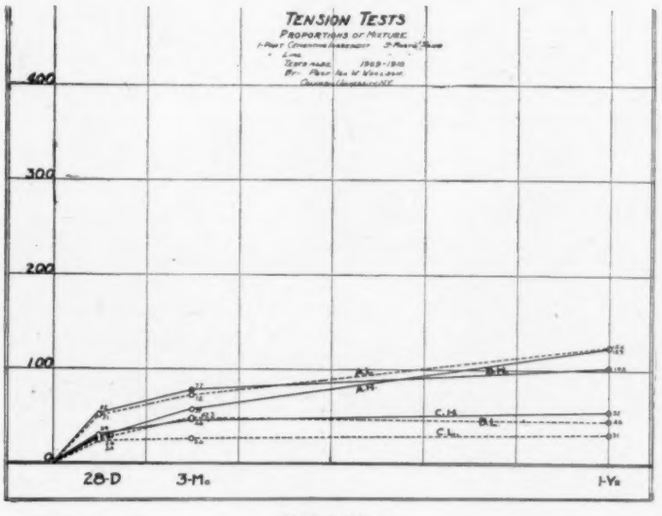
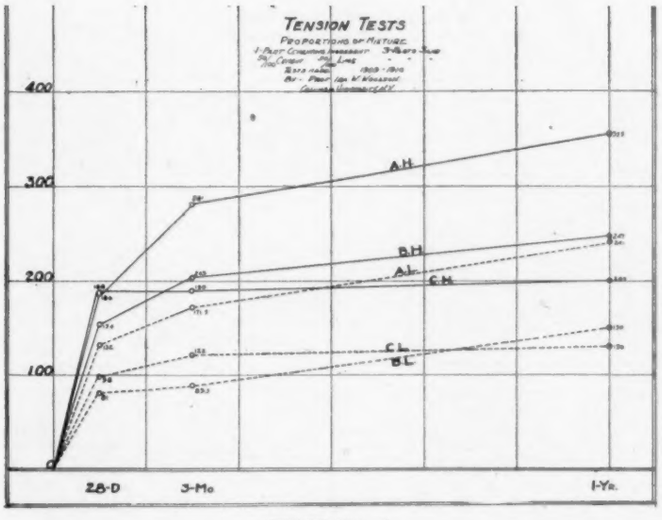


CHART NO. 2.



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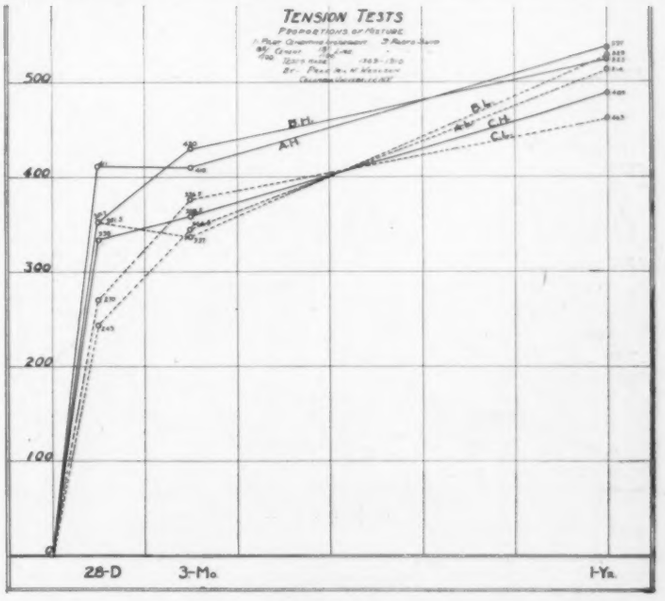

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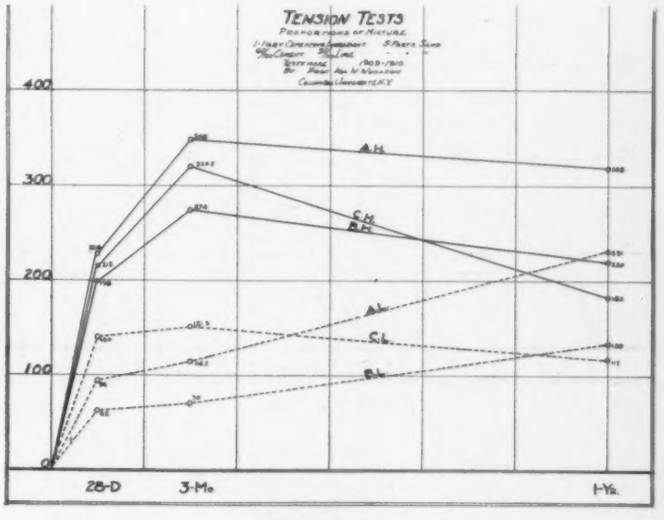


CHART NO. 5.

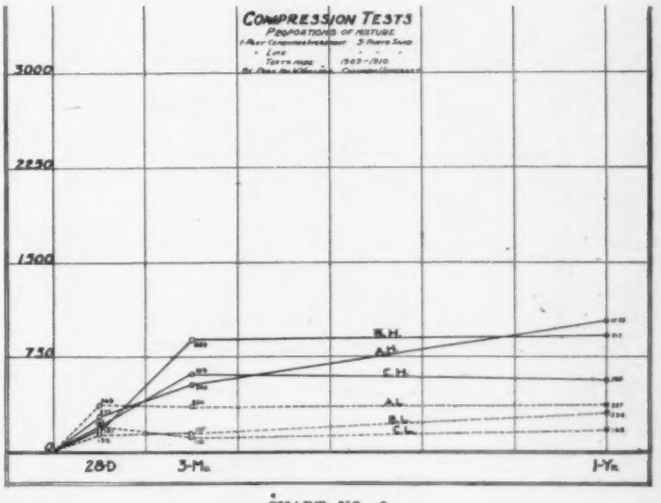


CHART NO. 6.

land cement or not, are stronger when prepared from hydrated lime than when prepared from quicklime. This might have been predicated, because the product of lime hydration by mechanical means in a plant properly equipped for the purpose is better than the product obtained by hydrating lime in the customary way of slacking with a hose and a hoe. In the common method of shelacking, the paste or mortar must be aged for a considerable time to insure the complete hydration of all the quicklime particles.

The greater strength of the mortars made from hydrated lime is well shown in charts No. 11, 12, 13 and

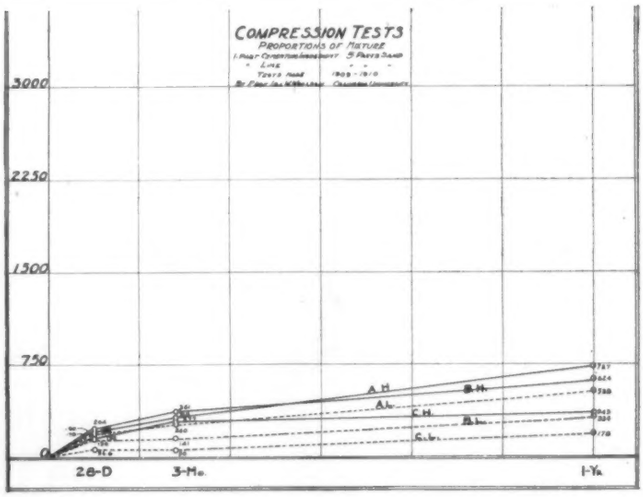
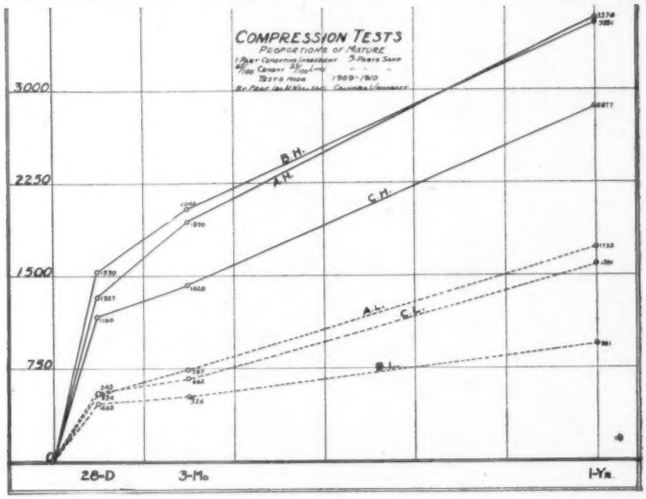


CHART NO. 7.



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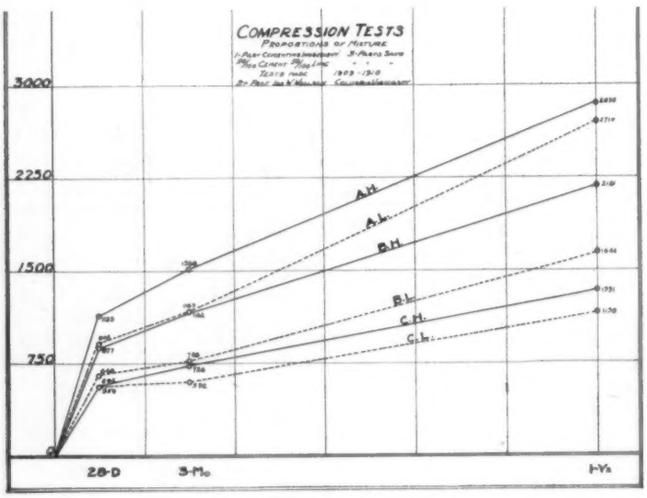

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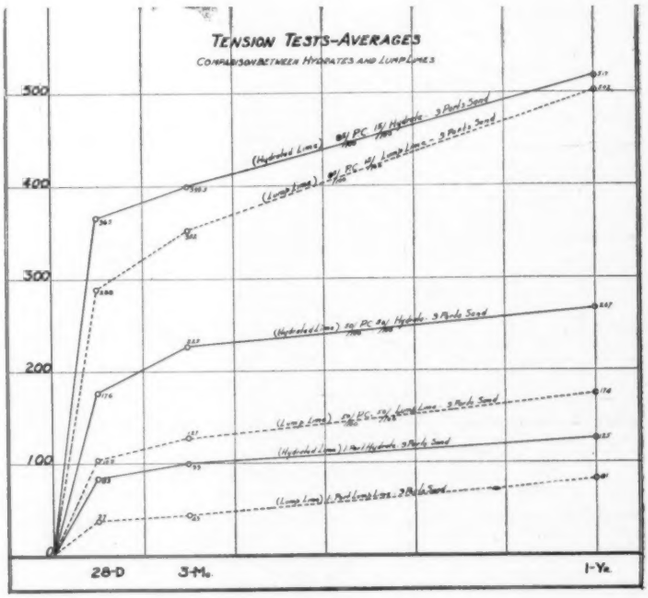

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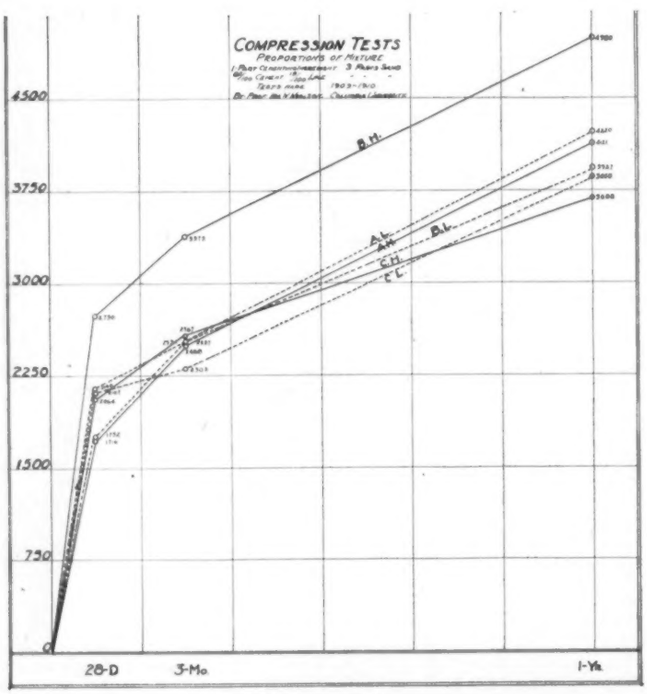

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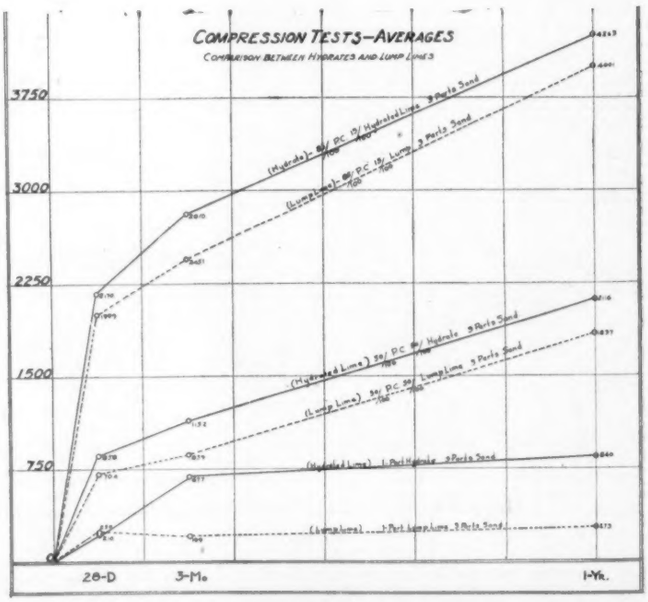

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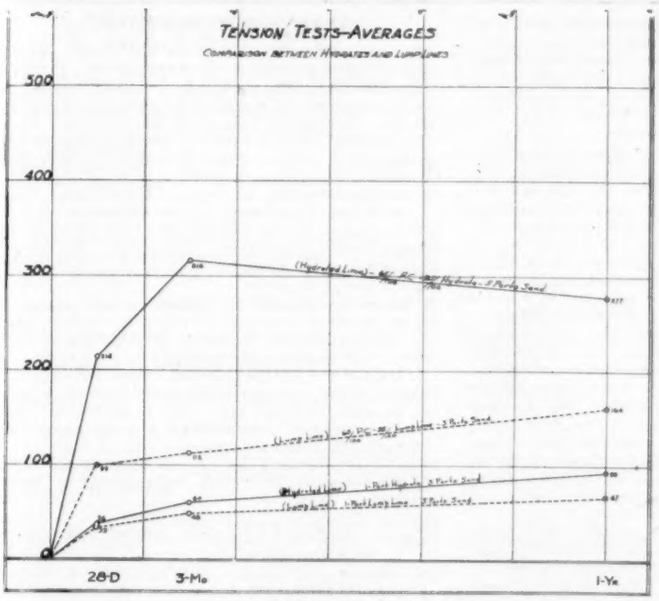

CHART NO. 13.

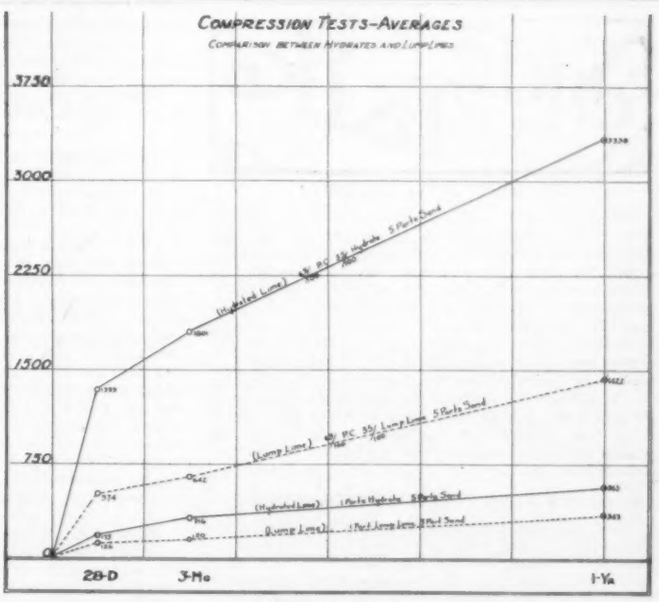

CHART NO. 14.

14. These charts were prepared by averaging the results obtained on similar tests of the three hydrated limes used and the three quicklimes used. An advantage of the use of hydrated lime in place of lime paste in the preparation of mixed mortars lies in the greater ease of incorporation of the dry hydrated material with the other ingredients.

2. The series of tests include five different mixtures tested both in compression and tension. Thus the set includes twenty tests in all. In sixteen tests out of twenty the dolomitic limes are shown to have been stronger at the end of one year than the high calcium limes. This confirms results obtained by other investigators that mortars made from dolomitic lines are stronger at the end of one year than mortars made from high calcium limes.

It is often stated that limes made from dolomite are unsuited for use in mortars containing Portland cement because of their high magnesium content. The results herewith given show no deleterious action from the magnesia, but on the contrary indicate that the magnesia is a valuable ingredient, contributing to the strength of the mortar.

It is well known that mortars made from dolomitic limes show no signs of disintegration even after years of exposure to the elements. This is proven by the long continued use of this class of limes in such districts as Philadelphia, where practically all the lime used since the foundation of the city has been made from dolomite.

THE LIMING OF SOILS.

The U. S. Department of Agriculture has just issued "Farmers' Bulletin No. 77," by H. J. Wheeler, Ph. D., which should be of especial interest to everyone interested in the production and use of lime. This can be secured by writing for it to the Dept. of Agriculture, Washington, D. C.

This bulletin contains valuable articles relating to the following subjects:

The use of lime for improving soils.
Direct manurial action of lime.
Chemical action of lime on soils.
Physical effects of liming.
Effect of lime on the action of microscopic organisms in the soil.
Liming sometimes injurious.
Plants benefited by liming.
Plants but little benefited by liming.
Plants usually or frequently injured by liming.
Influence of lime upon some plant diseases.
How often should liming be practiced.
When to apply lime.
How to apply lime.
Forms of lime used for agricultural purposes.
Summary.

Summary.

In the summary of the main subject is the following:

The use of lime as a soil improver is very ancient, and its value for this purpose is generally recognized. Its action as a fertilizer is both direct and indirect.

There are many soils in which lime is deficient, notably such as are derived from granite, mica-schist, and certain sandstones, slates and shales. On such soils lime is often of direct value in supplying a necessary element of plant food.

The indirect value of lime is perhaps more important than its direct action, because probably the majority of cultivated soils contain sufficient lime to meet the direct demands of plants for food. Lime is of indirect value in unlocking the unavailable potash, phosphoric acid and nitrogen in the soil.

Lime exerts a decided influence on the mechanical condition of soils, rendering heavy compact soils looser in texture and tending to bind particles of loose leachy soils.

Lime is also beneficial in furnishing conditions in the soil favorable to the activity of the micro-organisms which convert the nitrogen of organic matter into nitrates which are readily assimilated by plants, which decompose organic matter, and which assist certain leguminous plants to assimilate the free nitrogen of the air.

One form of lime, gypsum, has been shown to be a most effective corrective of black alkali, found in some of the soils of the arid portions of the United States.

The continued use of lime unaccompanied by other fertilizers may prove injurious, especially on poor soils, since it converts the insoluble nitrogen, potash and phosphoric acid compounds of the soil into such as can be rapidly taken up by plants or washed out in the drainage, thus hastening the exhaustion of the supply of these substances in the soil. As the German adage states, "The use of lime without manure makes both farm and farmer poor." If the soil is not abundantly supplied with organic matter its retentive power for water and fertilizers may be seriously reduced on account of the destruction of the organic matter by the action of too much lime. Soils may sometimes be injured by appplications of impure forms of lime, which harden like cement in the soil, or of those which contain an excessive amount of magnesia.

It has been shown that even upon many upland and naturally well drained soils apparently in good condition otherwise the sourness (acidity) is so great that most varieties of plants will not thrive. Lime is the most economical and effective substance thus far used for correcting this condition. According to experiments made by the Rhode Island Agricultural Experiment Station on acid soils in that state, the plants tested may be classified with regard to their behavior toward lime as follows: *Plants benefited by liming*—spinach, lettuce (all kinds), beets (all kinds), okra (gumbo), salsify (vegetable oyster), celery, onion, parsnip, cauliflower, cucumber, eggplant, cantaloupe, asparagus, kohl-rabi, cabbage, dandelion, Swedish turnip, pepper, peanut, English or flat turnip, upland cress (pepper grass), martynia, rhubarb, common pea, pumpkin, summer squash (scalloped), golden wax bean, red Valentine bean, horticultural pole bean, bush Lima bean, lentil, Hubbard squash, saltbush, hemp, tobacco, sorghum, alfalfa, clover (red, white, crimson and alsike), barley, emmer, wheat, oats, timothy, Kentucky bluegrass, Canada pea, Cuthbert raspberry, gooseberry, currant (White Dutch), orange, quince, cherry, Burbank Japan plum, American linden, American elm, sweet alyssum, mignonette, nasturtium, balsam, pansy, poppy and sweat pea; *plants but little benefited by liming*—Indian corn, spurry,* rye, carrot, chicory, Rhode Island bent and redtop; *plants slightly injured by liming*—cotton, tomato, cowpea, zinnia, phlox (Drummondi), Concord grape, peach, apple and pear; *plants distinctly injured by liming*—lupine, common sorrel (*Rumex acetosella*), radish, velvet bean, castor bean, flax, blackberry, black-cap raspberry, cranberry, Norway spruce and American white birch. Other plants said to be injured are the chestnut, azalea and rhododendron.

Many kinds of lime are available for agricultural use, among which are caustic or burnt lime, or quicklime, which should contain at least 90 percent of actual lime (CaO) and is the most concentrated form of this material; gypsum, or land plaster, in which the lime is in the form of the mild sulphate; ground limestone and chalk, in which the lime is in the form of the mild carbonate; different kinds of marl, containing varying proportions of sand and clay and from 5 to 95 per cent of carbonate of lime; wood ashes; wood ashes, which contain from 30 to 35 per cent of lime in the form of carbonate; limekiln ashes, containing about 40 per cent of lime, and waste lime from gas houses, sugar beet factories, etc., the composition of which varies with the process of manufacture.

It is impossible to state definitely for all locations and conditions what kind of lime is cheapest to use. Caustic or quick lime is the most concentrated and consequently the most economical to handle. On account of its caustic properties it is more vigorous in its action than the milder sulphate (gypsum) or carbonates (limestone, chalk, wood ashes, marl, etc.). There may be special reasons, however, why some of the latter may be preferable. For instance, gypsum, on account of its peculiar composition, has been found to be a specially valuable corrective of black alkali.

The frequency with which liming should be practiced depends, among other things, upon the character of the soil and the rate of application, the number of years involved in the rotation practiced, the plants grown and their order of succession. As a general rule, it may be stated that from one-half to one and one-half tons of lime per acre every five or six years is sufficient. Applications of two or three tons may, however, be advisable in cases of very acid soils which are to be seeded down and are to remain in grass for several years. The practice of applying small amounts of lime at somewhat frequent intervals is being generally accepted as preferable to the use of large amounts at rare intervals.

Lime combined as carbonate, as in marl, wood ashes, etc., can usually be applied with safety in the spring or at any other season of the year, but autumn is always the safest time to apply caustic or slaked lime. It is generally considered best to apply the lime to the soil immediately after plowing and harrow it in thoroughly. Lime which is already slaked maye be spread upon the soil directly from wagons or carts, or dumped into heaps and then spread with a shovel, although the most satisfactory plan in such cases is to use a lime spreader or ordinary grain drill with a fertilizer attachment. Where a lime spreader or similar implement is not available the burnt lime may be placed on the soil in piles of from 40 to 50 pounds each, covered with moist earth, and allowed to slake before being spread with a shovel. Marls frequently contain injurious compounds and should therefore be allowed to weather for some time in the field before being incorporated with the soil. The same is true of gas house lime, which is impregnated with sulphur compounds which are injurious to plants.

In conclusion it may be said, ascertain first whether lime is needed. If it is, apply it judiciously, and never depend upon lime alone to maintain the fertility of the soil, for all of the ingredients which plants need must be present in the soil to insure the profitable production of crops.

* It has been reported in England that spurry is injured by liming, but such results have not been obtained in Rhode Island.

CHICAGO LIME NEWS.

Chicago, Sept. 22.—Quiet conditions characterize the lime trade of this city this month. Business on the whole is perhaps equal to that of the past two months. There are few indications at present that these conditions will change materially this fall. Manufacturers report that they are busy, but anticipate better business with the approach of fall. In other words, business has been backward so far. Prices are steady.

Arthur T. Howe, president of the Marblehead Lime Company, said: "Business has hardly been satisfactory this month, having fallen off fully 30 per cent compared with the same period last year, and there are no indications that there will be much of an improvement. Inquiries are few and the demand not as heavy as it should be. Prices are steady."

"There is absolutely nothing new to say about the lime trade for this month," said Julian J. Pleas, vice-president of the Chicago Union Lime Works. "We are jogging along smoothly enough, but could attend to much more business than is coming in lately. Prices remain the same as they have been for several months. Conditions are fairly good."

"We are continuing to sell all the lime we manufacture, orders coming in rapidly," said E. P. Bostler, auditor of the Rockwell Lime Company. "We are running full time to full capacity and shall continue to do so to the end of the season."

At the office of the Stearns Lime & Stone Company conditions were found the same, practically, as last month. No marked increase in demand was reported for September. Prices are unchanged and steady, while prospects are considered good for the fall months.

A NEW CEMENT PLANT.

Birmingham, Ala., Sept. 20.—The Mobile Portland Cement Company, of St. Stephens, Ala., T. L. Robbins president, and Dr. O. Gerlach manager, is arranging to place a $2,000,000 order for structural steel, machinery and equipment for its plant now in process of erection.

Side Talk

CYCLONE DRILL CO. BUSY.

The Cyclone Drill Co. of Orrville, Ohio, write that they have more orders on the books than at any time in their history. Amongst the recent sales made by this company are the following: Nine blast hole drills for Jno. B. Carter Co. for various contracts in Maryland and Pennsylvania; four prospecting machines for Jacobs & Davies for testing foundations for the large government dam on the Tennessee River near Chattanooga, Tenn.; blast hole machines for the Empire Limestone Co., Buffalo, N. Y.; blast hole machine for the Shore Line Stone Co., Monroe, Mich.; blast hole drill for the France Slag Co., Toledo, O.; together with a number of water well drills and prospecting outfits for various concerns.

MACHINERY FOR CEMENT MAKING.

The Allis-Chalmers Company has just issued its bulletin No. 1444, entitled "Machinery for Cement Making." This deals particularly with ball mills and tube mills and their accessories. Numerous plates are given showing the details of the different pieces of apparatus together with installations.

In speaking of pulverizing apparatus, attention is called to a very important part which the ball mill plays. In pulverizing operations for crushing dry, raw material to a point where it will pass a 20 mesh sieve, nothing could be more satisfactory than the Allis-Chalmers Ball Mill. This mill has inwardly protecting shelves with spaces between them which allow the crushed material to pass through and onto the screens outside of the shelves. That material which is crushed finely enough passes through the screens while the rest drops back into the interior of the mill and is again brought in contact with the balls. One great advantage of the ball mill is its compactness.

The Gates tube mill used in cement plants throughout the country has the advantage of being both an excellent fine grinder, reducing the crushed material so that 92 per cent will pass a 100 mesh screen, and at the same time being one of the best mixing devices on the market. It mixes the various ingredients of the cement so that it comes out absolutely uniform and without streaks.

The Allis-Chalmers tube mill consists of a steel plate cylinder provided with driving gear. It may be lined with silex, ironite, porcelain or chilled iron. Most of the tube mill users in this country, in the cement industry, favor the silex or ironite lining. The Allis-Chalmers Company manufactures tube mills in sizes from 3½ by 14 feet to 8 by 22 feet. It also builds the necessary feeders and can supply steel balls or other crushing material.

C. O. BARTLETT & SNOW CO.

The C. O. Bartlett & Snow Co., engineers and manufacturers of elevating and conveying machinery, screens, crushers, plaster mixing plants, etc., at Cleveland, Ohio, have leased the property just vacated by the McNyles Manufacturing Co., on Columbus street, in Cleveland, near their present works. This property consists of buildings, yards, trackage and a complete power plant. Additional machinery has already been purchased and is now being installed. They will commence operating at once. This property is located near the center of the city and contains 76,000 square feet of floor

FOREIGN TRADE OPPORTUNITIES.

The daily consular and trade report issued by the Bureau of Manufactures at Washington, D. C., publishes the following:

5326. **Stone-crushing machinery.**—An American consul in Asia writes that the secretary of a municipal council invites manufacturers of stone-breaking machinery and quarry appliances to send particulars of their products. As all the roads in the island are built with crushed stone, the consul believes that it would be profitable for American manufacturers of stone machinery to secure a foothold there.

Inquiries in which addresses are desired will be duly answered by the above named Bureau, where the desired information is kept on file.

William J. Bailey who recently returned from a successful trip around the world representing a number of American manufacturers, is now preparing another business tour. He expects to leave this country early in the fall and will be gone about a year, visiting the leading commercial centers of the world. Mr. Bailey markets his lines in conjunction with permanent sales offices in the different countries so that this trip would no doubt be of interest to manufacturers seeking foreign trade. His address is 32 Broadway, New York.

W. B. Ruggles and Robert G. McGann, president and vice president of the Ruggles-Coles Engineering Co., have recently returned from a three months' trip abroad where they went to study the conditions of the dryer business. They have placed agencies with the Electro Metals Co., Ltd., of London, a well known company of mining engineers; with M. J. Davidson, of Paris, the expert cement engineer and original patentee of the tube mill; with Walther Ferber, of Hamburg, a prominent mechanical engineer and importer of machinery; and with Akliebolaget Mekaniska Verkstaden Aliens, of Stockholm, Sweden, probably the best known concentrating and briquetting engineers on the Continent. Before sailing for home, Messrs. Ruggles and McGann closed orders for six large dryers, two for concentrates and one each for coal, rock, clay and sewage works sludge. The Ruggles-Coles Engineering Co. report seventeen dryers being built in their shops at the present time and many inquiries.

Thousands of farmers still count the cost of painting their ready roofings as a necessary part of their annual expense. Many of them are making trouble for themselves in the future by laying roofs which require constant attention.

There is a modern and better way of treating the roofing problem.

Amatite Roofing has come upon the market during the last few years and has proven a success. Amatite is like any other ready roofing (sold in rolls with nails and cement free, etc., ready to lay), except that it has a mineral surface which needs no painting.

It is just as easy to lay Amatite as any other roofing and just as cheap. The difference is that after you have laid your Amatite roof, you can leave it alone. The mineral surface is thoroughly durable and requires no painting.

If you do not know about Amatite, we advise you to investigate it. You can get a booklet about it and a free sample by simply addressing the nearest office of the Barrett Manufacturing Co., New York, Chicago, Philadelphia, Boston, Cleveland, Cincinnati, Pittsburg, Minneapolis, St. Louis, Kansas City, New Orleans, London, Eng.

Only Time in his infallible laboratory, or the modern scientist with a battery of testing paraphernalia, can tell the true inwardness of quality in brick, tile or cement products. One point of quality the purchaser is quick to note, however, and that is appearance. A batch of off color brick or cement work, is apt to bring a mighty prompt roar of protest from both the builder and the owner of a structure. Next to price, clean, bright color is the strongest sales argument that the maker has.

Absolutely pure, mineral colors like Ricketson's "Red Brick" brand, cost a fraction more per barrel than the uncertain kinds, but their greater strength likewise makes them go farther, so that the point of economy lies altogether with the high grade color. "Red Brick" brand colors have been made famous by their "Never Fade" slogan. They are manufactured from the stable oxides in the purest Bessemer ores and come in five tints—red, brown, buff, purple and black. A letter to the Ricketson Mineral Paint Works, Milwaukee, will bring free samples.

A concrete mixer, hoisting engine, concrete elevator and other material were bought this month by the Roebling Construction Company and sent to Denver, Colo., for installation, the sale being made by the Marsh-Capron Manufacturing Company, of Chicago. This manufacturing company also reports for this month a similar equipment sold to C. W. Parker, of Abilene, Kan., for his large factory now in course of erection at Leavenworth, Kan. Mr. Parker fifteen years ago built up a unique business in Abilene, which has grown to great proportions—that of manufacturing all kinds of amusement devices for parks throughout the country. It is said he has over one-half a million of dollars invested in his enterprise.

The Chicago Concrete Machinery Co., of 221 Grand avenue, Milwaukee, has issued an attractive booklet illustrating briefly the Chicago Concrete Mixer sold by them. The booklet illustrates the various styles of the machine with the various attachments. This booklet will be sent to anyone, who may be interested, upon application.

WATERPROOFING CEMENT.

St. Louis, Mo., Sept. 20.—The McCormick Waterproof Portland Cement Company, Bank of Commerce Building, St. Louis, have created a great deal of interest in cement and concrete circles in the New McCormick process of waterproofing Portland cement. It is a positive waterproofing of the cement itself and the company makes the following claims regarding the process:

Is waterproof under any pressure to which structures containing concrete are subjected.
Resists action of sea water.
Resists action of alkalies.
Resists action of sewage.
Resists action of gases.
Resists action of acids in solution.
When mixed at the mill does not require other labor or conditions than now employed.
Where any considerable quantity is to be used, a simple and efficient mixing machine is loaned.
Cement blocks with one-half inch face of Waterproofed Cement, laid and tuck-pointed with Waterproofed Cement, form a positive and permanently waterproof wall.
Price of compound in 52½-pound sacks seven cents per pound, F. O. B. any railroad station in the United States.
Special discounts in large quantities.
Original qualities of cement waterproofed are in no way altered.
Our testing and chemical laboratories are at the service of our customers free of charge.

An illustrated catalogue of 64 pages has just been issued by Chalmers & Williams, Chicago, manufacturers of cement machinery. The catalogue is handsomely gotten up typographically and profusely illustrated with its Kennedy Gyratory crushers, with full descriptions in detail. This catalogue will only be sent on application, and people interested in gyratory crushers will receive the same by writing to Chalmers & Williams, Chicago.

Articles of incorporation have been filed by the Jennings Back Plaster Board Co., of St. Joseph, Mich. C. D. Jennings, M. J. Beckett and J. C. Schwerdt are the incorporators. The company has been organized for the purpose of manufacturing and selling plaster board, a material which has found much favor in the neighboring districts.

Milton J. Williams, general sales agent for The Williams Patent Crusher and Pulverizer Company, in the Old Colony Building, Chicago, reports business in general good. He is selling lots of Williams Limestone Grinders and states the shops of the company are full of orders. The outlook for business here, he says, is good.

John Frederic Munn, 419 Fisher Building, Chicago, sales agent for the Cyclone Drill Company, reports having received the following orders this month: From F. B. Martin & Co., Fiborn Quarry, Michigan, a No. 14 steam traction Cyclone blast hole drill; Chicago Exploration Company bought two No. 5 double walking beam Cyclone drills for their Utah holdings, shipping them out there the early part of September; the Ogden San Juan Oil Company, of Utah, bought a No. 5 double walking beam Cyclone drill, and the Dolese Brothers Company bought a No. 14 gasoline traction Cyclone blast drill for its quarry at Apache, Okla. Mr. Munn said inquiries were light at present, but prospects are good. Business, he stated, is holding up remarkably well in the water well drill line.

The Austin Manufacturing Company report increasing activity in the crusher trade of late, having taken several nice orders. Among the number lately received they report the following:

J. G. White Company, New York City, two No. 8 and two No. 5 crushers, with elevators, screens, cars etc., the entire order amounting to more than $23,000.00; Edgemoor Sand and Gravel Company, Beaver, Pa., No. 4 plant; F. J. Rothwell, St. Louis, Mo., No. 3 plant; Archbald Stone Company, Scranton, Pa., No. 7½ crushing plant, and Oscar Sanders, Bloomington, Ind., No. 3 plant, mounted.

Francis L. Robbins, former president of the Pittsburg Coal Company, has been elected president of the Mobile Coal & Portland Cement Company, of New Orleans, La. Mr. Robbins was formerly a leading coal operator in the Pittsburg district and also president of the New Pittsburg Coal Company, of Columbus, Ohio.

CLASSIFIED ADVERTISEMENTS

Advertisements will be inserted in this section at the following rates:

For one insertion .....25 cents a line
For two insertions .....45 cents a line
For three insertions .....60 cents a line

Eight words of ordinary length make one line.
Heading counts as two lines.
No display except the headings can be admitted.

Remittances should accompany the order. No extra charges for copies of paper containing the advertisement.

EMPLOYEES WANTED

WANTED.

If you are in need of or wish to sell anything which comes under any of these classifications, write us. If you have something not coming under these classifications we will create one for you.

LIME WORK SUPERINTENDENT.

Wanted, general superintendent for medium sized lime plant. Must be capable and familiar with quarrying rock as well as burning lime. Will expect you to have charge of general work around the plant. References required. State experience.
Address 781, care ROCK PRODUCTS.

SUPERINTENDENT OF LIME WORKS.

Wanted—A general superintendent for a lime plant in Missouri; daily output 500 barrels. Must be familiar with quarrying rock and burning lime, as well as with general work around plant. Advise No. 776, care ROCK PRODUCTS.

EMPLOYMENT WANTED

ALL ROUND MAN

wants position as superintendent, manager or foreman of quarry and crushing plant. Have had many years' experience. Can furnish best of references. Am sober and industrious. Address 780, care ROCK PRODUCTS.

SUPERINTENDENT, MANAGER OR FOREMAN.

Position wanted as superintendent, manager or foreman of quarry and crushing plant by man 36 years old, with years of experience and best of references. Address GEORGE A. HORTON, Moline, Kan.

SUPERINTENDENT OF LIME WORKS.

Position wanted as Supt. of Lime works or large stone quarries, fourteen years' experience, a hustler and can furnish best of references.
Address D. O. S., care ROCK PRODUCTS.

PLANT FOR SALE

LIME PLANT.

For Sale or Rent—Sugar Creek Lime and Cement Co. Plant.
Address Box 29, Barney Timmer, Browns, Iowa.

SAND LIME BRICK PLANT.

We have machinery complete for sand lime brick plant. What have you to offer for materials and market? Address No. 777, care ROCK PRODUCTS.

BUSINESS OPPORTUNITIES

HIGH GRADE SALESMEN AND REPRESENTATIVES.

United States, Mexico and Canada, calling on architects, engineers and contractors, to handle our product on an extremely profitable commission basis. Address McCORMICK WATERPROOF PORTLAND CEMENT CO., St. Louis, Mo.

MACHINERY WANTED

SECOND-HAND COMPRESSOR WANTED.

Second hand compressor wanted. To run three and one-quarter drills. Must be in good condition.
Address 782, care ROCK PRODUCTS.

SECOND HAND TUBE MILLS

wanted; 8' down to 6' diameter, 8' to 12' in length. Address No. 779, care ROCK PRODUCTS.

MACHINERY FOR SALE

SCHENK DRAIN TILE MACHINE.

For Sale—Schenk drain tile machine, fully equipped, in first class condition. Address H. R. NEWTON CO., Missouri Valley, Ia.

1910

Velten Universal Crusher

Reduces the hardest Rock and Gravel Instantaneously TO ANY REQUIRED FINENESS

Simple, Practical, Durable

Light in weight, yet strong. **Less parts and less friction than any other crusher.**

A CRUSHER AND PULVERIZER COMBINED

Covered by U. S. Patents. Save the price of the **Royalty and Buy Direct.** Price, terms, guarantee, will be made to suit you. A trial will convince you.

CALL OR ADDRESS

Universal Crusher Co. WORKS AND OFFICE: 2d Ave. and 10 St., W.
CEDAR RAPIDS, IOWA, U. S. A.

THEW SHOVEL.

For Sale—No. 3, overhauled, first class shape. Also narrow and standard gauge locomotives. Address Southern Iron & Equipment Co., Atlanta, Ga.

SAND LIME BRICK PLANT MACHINES.

For Sale—Machines complete for sand lime brick plant in good condition and ready for operation.
1 Berg press.
1 150 H. P. high pressure boiler.
1 Fuller Lehigh mill.
2 steel side dump cars with brake.
1 American process dryer.
6 T. 30 lb. steel rail.
3 Trump measuring machines.
1 hardening cylinder, 72" by 75'.
40 roller bearing brick cars.
1 Sturdevant crusher.
Address No. 778, care ROCK PRODUCTS.

RUBBER BELT.

For Sale Cheap—2 pieces 18 inch 5 ply rubber belt, with ⅛ inch extra rubber one side; one piece 215 feet and one piece 346 feet. Absolutely new at factory in Chicago. A. M. BLODGETT CONSTRUCTION CO., Kansas City, Mo

Attention, Quarrymen!

For sale—No. 8 Austin Gyratory Crusher.
No. 7½ Austin Gyratory Crusher.
No. 3 Austin and 2 No. 6 Gates and No. 5 "D."
70-ton Vulcan Steam Shovel, 2-yard.
50-ton Bucyrus Steam Shovel, 1¾-yard.
Loco. Crane, with 1¼-yard Clam Shell.
Little Giant Traction Steam Shovel, 1-yard.
Hayward Orange Peel Buckets, 1 and 1¼-yard.
Lidgerwood No. 71 Hoist and No. 424 Mundy.
Stiff Leg Derrick with 18"x18" mast and boom, 18"x18"x68 feet, complete with extra heavy American irons rigged for 3-part line.
Concrete Mixers, Concrete Buckets, Steam Rollers, Air and Steam Drills, Air Compressors, Pumps, Boilers, Locomotives, Dump Cars, etc.

Send for our Oct. Booklet.

Willis Shaw Machinery Co.
171 La Salle St., Chicago, Ill.

JAS. B. MACNEAL & CO.
Baltimore, Md.
CALVERT MORTAR COLORS
Prices and samples on request

F. A. JONES, M. E. GYPSUM SPECIALIST.

Consulting Mechanical, and Chemical Engineer in Designing; Construction, and Operation of Plaster Mills, Mines, and Mixing Plants. Plans, Specifications, Estimates of Cost, Superintendence of Construction, Rotary or Kettle Process. Examination, Tests, Analyses, and Reports of Gypsum Properties, Mills Remodeled and Enlarged, Mixing Plants Erected, and Formulas Furnished.

YOUNGSTOWN, OHIO.

Some Bargains in Quarry Equipment

COMPRESSORS

One 16x16x18 McKiernan straight line compressor, capacity 600 feet of air. Ample for 6 to 10 drills. Ready for immediate use.
One Ingersoll-Sargent duplex, class H 12x12x14½. Capacity 635 feet of air. Almost new.
One Rand 12x12x16 straight line, capacity 250 cubic feet.

CRUSHERS

1 No. 3 Gates, Style D. Almost new.
1 No. 4 Gates, Style D. Fine condition.
1 No. 5 Gates, Style K. Good as new.
1 No. 5 Austin, with 60' elevator and rotary screen and power plant. Will sell all or split.
1 No. 6 Austin. Used one season.
1 No. 7½ Austin plant complete.
1 No. 8 Gates plant complete and a lot of elevators, screens, friction hoists, etc.

STEAM SHOVELS

Two 75-ton steam shovels, built especially for handling broken stone. Used less than one year; left the shop late in 1907. Great bargains for anybody who wants loading shovels.
We have several smaller shovels for stripping and other work.

LOCOMOTIVE CRANES

One 15-ton Interstate, with 44-foot boom, 1-yard clam shell bucket on standard gauge truck. Absolutely first class condition. Can be seen in operation.
One 10-ton Yale & Towne, 30-foot boom, no bucket. Absolutely first class condition.
Also have some others.

SCREENS, ELEVATORS, ETC.

We have a lot of standard Gates, Austin and other screens and elevators, friction hoists, and other hoisting appliances.

Be sure and write us for prices before you buy ANY KIND OF EQUIPMENT—SAVE YOU MONEY

MARSH COMPANY, 971 Old Colony Building, CHICAGO, ILLINOIS

THE HENRY MARTIN BRICK MACHINE MFG. CO.
LANCASTER, PENNA.

ROCK CRUSHING MACHINERY
BRICK-MAKING MACHINERY
CLAY-WORKING APPLIANCES
CEMENT BRICK MACHINERY
SAND GRINDING MACHINERY
SAND DRYERS, BRICK DRYERS, ETC.

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"K & J" CARS FOR QUARRIES

"K & J" CARS FOR QUARRIES

"K&J"

An extremely heavy skip. Length, 10 feet; width, 4 feet; depth, 4 feet 3 inches; all inside dimensions. Capacity 165 cubic feet.

We Build Every Type of Car that Quarry Work Demands.

Get Booklet "Some Car Suggestions."

"K & J" Cars are built for "Continuous Service."

The Kilbourne & Jacobs Mfg. Co.

Plant and General Offices, COLUMBUS, O. NEW YORK 25 Broad St.

ROSENOW CO.
CHICAGO

DESIGNS AND ENGRAVINGS OF EVERY DISCRIPTION

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COLOR PRINTING AND ENGRAVING
THE BEST WORK GUARANTEED AT MOST REASONABLE PRICES
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TEL HARRISON 130

Fast Trains Day and Night on the MONON ROUTE

EXCELLENT SERVICE
BETWEEN
Chicago
La Fayette
Indianapolis
Cincinnati
Dayton
West Baden and
French Lick Springs
Louisville

Electric Lighted Standard Sleepers on Night Trains, Parlor and Dining Cars on Day Trains

Frank J. Reed, G. P. A. E. P. Cockrell, A. G. P.
CHICAGO

IMPORTANT

Advertisers—Take Notice

Changes of Copy must be in this office by the Fifteenth of the month, if proofs are desired; if no proofs are required the desired changes can be made if copy is received by noon of the Nineteenth.

New Advertisements to insure proper classification, should be in this office by the Fifteenth of the month, but they can be inserted in the last form going to press if received by the Nineteenth. The punctual publication of the paper admits no deviation from these rules. Advertisers are earnestly requested to co-operate with us.

THE FRANCIS PUBLISHING CO., 355 Dearborn Street CHICAGO, ILLINOIS

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CLASSIFIED BUSINESS DIRECTORY

BAGS.
Urschel Bates Valve Bag Co.
West Jersey Bag Co., The

BALL MILLS.
Alsing, J. R., Eng. Co.
Power & Mining Mchy. Co.

BELTING.
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Harbison-Walker Refractories Co.

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Alpha Portland Cement Co.
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Chicago Portland Cement Co.
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Dexter Portland Cement Co.
French, Samuel H., & Co.
Hartranft, Wm. G., Cement Co.
Kansas City Portland Cement Co.
Ironton Portland Cement Co.
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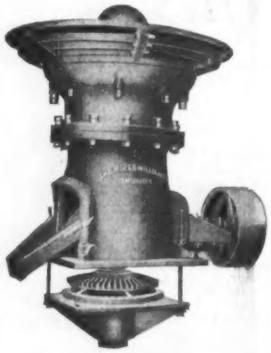


The Kennedy Gyratory Crusher

THE ONLY CRUSHER

With a Ball and Socket Self-Aligning Eccentric

This crusher is proving its superiority over all other makes of crushers in all parts of the country. We can give interesting data from operators, regarding the **greater capacity, small cost for repairs, perfect alignment, great reduction in power to operate and perfect coolness of the eccentric.**

We also Build Cement Making Machinery

Kilns, Dryers, Coolers, Crushing Rolls, Ball Mills, Tube Mills, Elevators, Conveyors and Revolving Screens.

CHALMERS & WILLIAMS, Inc., 1929 Commercial Nat'l Bank Bldg., CHICAGO

HOWELLS' Celebrated Ball Bearing Heavy Geared Post Drills

For boring anything that an Auger will penetrate.

Awarded Gold Medal, St. Louis.

We make 40 different styles machines run by Hand, Compressed Air and Electricity for boring Fire Clay, Coal, Rock, Rock Salt, Gypsum and Plaster Rock. Send today for our handsomely Illustrated Catalogue.

HOWELLS MINING DRILL CO., PLYMOUTH, PA. U. S. A.

(ESTABLISHED 1878.)

ALLIS-CHALMERS CO

Style "K" Rock and Ore Breakers

NO CLOGGING

The stone spouts directly from the hopper into the opening between the head and the concaves. This arrangement enhances the feeding capacity and overcomes the tendency to arch and prevent wear on spider.

Have Large and Unobstructed Feed Openings

NO LOSS WORKING TIME

The hopper rests directly on the top of the shell, near the upper ends of the concaves, thus reducing the height of breaker from foundation to feeding floor.

Built to Meet Operating Conditions

GENERAL OFFICES:

Milwaukee, Wis.

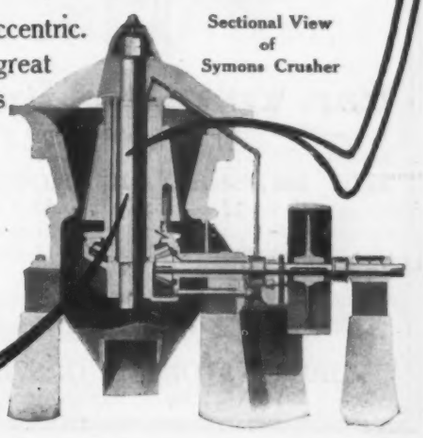
District Offices in all Principal Cities

TAKE A SQUINT

Mr. Stone-Man, at that central shaft. It is not merely suspended. It is not just supported. It is a big bolt—a short, thick steel forging of enormous strength, tying the stocky, two-piece frame into a rigid unit which not the hardest usage can break or budge. That big central bolt tells why the strongest crusher on the market is the

SYMONS CRUSHER

Look at that eccentric, encasing the shaft, and at the headliner enclosing the eccentric. To break the shaft, you must also shear eccentric and headliner. Note the great length and large diameter of the eccentric. Imagine the great main bearings constantly drenched with oil, five gallons per minute if needed. Then, calculate the area of the feed openings and don't forget, in figuring capacity, that the head moves as far at the top as at the bottom.



Sectional View of Symons Crusher

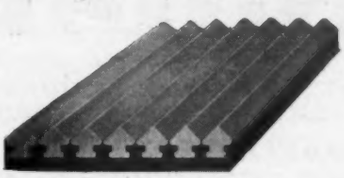
Write for Catalog No. 166.

THE T. L. SMITH COMPANY

MAJESTIC BUILDING, MILWAUKEE WIS.

A Tempered Steel Jaw Plate for Blake Type Crushers

CHROME STEEL WORKS
CHROME, N.J., U.S.A.
(FORMERLY OF BROOKLYN, N.Y.)



Canda Tempered Steel Crusher Jaw Plate

Patented March 31, 1908

¶ The Canda Tempered Steel Jaw Plate for Blake Crushers is composed of Forged and Rolled Chrome Steel Bars, cast-welded and also mechanically interlocked into a backing of tough steel—and the wearing face is tempered to extreme hardness. We are equipped to supply both corrugated and smooth face plates for all sizes and makes of Blake Crushers.

¶ The Canda method of cast-welding forged and tempered steel bars into a mild and tough Steel Backing, is adapted also to the construction of Cone Heads for Gyratory Crushers, Segments for Corrugated Rolls, etc., etc.

¶ Our products in this line are sold with our special guarantee that they *will wear longer, give better satisfaction and, at our price, prove more economical than any others now on the market.*

—Send for Descriptive Pamphlet—

Represented by

J. F. Spellman, 202 Century Building, Denver, Colo. George T. Bond, Easton, Pa. George W. Myers, San Francisco, Cal.

AUSTIN GYRATORY CRUSHER

The World's leading rock and ore breaker.

The only self lubricating Crusher.

The only Crusher having double countershaft bearing.

Simple construction, correct design.

Thousands in use.

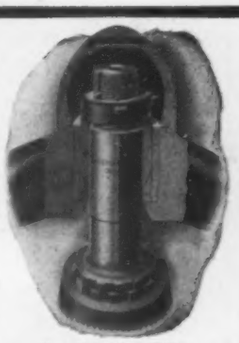
Plans and specifications furnished for any sized plant.

Send for Catalogue No. 17.

All experienced users recognize that the efficiency and durability of the suspension bearing as applied to Gyratory Crushers, depends upon locating the bearing at the point of least gyration or movement of the main shaft.

A perfect suspension can be made only by locating the bearing at the point where there is no movement of the shaft. That being a mechanical impossibility it follows that superiority is obtained in fixing the bearing at the point of least gyration of the shaft.

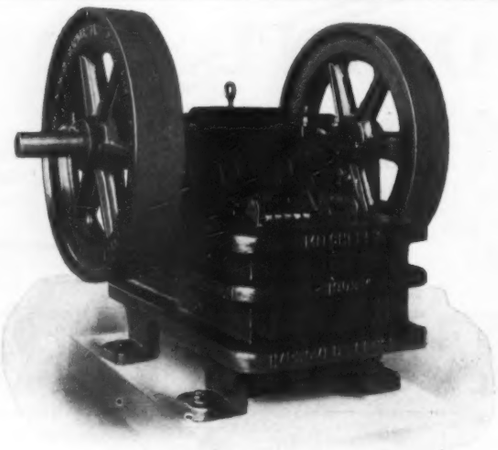
As the accompanying cut will show, the movement of the shaft at the point of suspension in the Austin Crusher is reduced to the minimum and practically eliminated. Consequently the highest possible degree of efficiency and durability is obtained.



Austin Manufacturing Co., Chicago

New York City Office
1682 FULTON BUILDING
Hudson Terminal

Mussens Ltd., Montreal, Can., Canadian Sales Agents.



Can You Use ½-Inch Rock?

There is a growing demand among contractors and road builders for rock in ½ inch sizes.

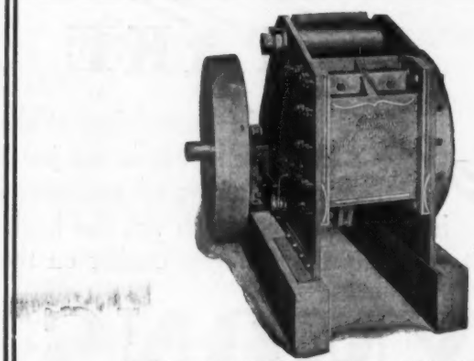
THE MITCHELL IMPROVED CRUSHER

Is the only machine which will reduce rock as it comes from the quarry to pass a ½ inch ring in one crushing. It crushes over 80% uniform. It saves 25% in operating cost. It's so simple that no mechanic is required to run it.

We also make sizes which will crush 4 inch rock to sand in one operation. Ask about our all steel Eureka Crusher.

May we send you our new catalog 6R just off the press?

EUREKA STONE & ORE CRUSHER CO.
CEDAR RAPIDS, IOWA.



No. 5 Champion Steel Rock Crusher, 11x26 in. Opening.

Speaking of ROCK CRUSHERS

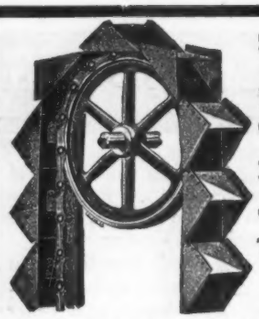
there are over 3,000 Champion Machines in use. Every machine is speaking for us by the good work it is doing.

Champion Crushers are made of steel. They work well and last well. We offer them as the best and most economical crushers made.

Five different sizes, from 75 to 300 tons daily capacity. Elevators, screens, conveyors, engines, boilers. Complete plants installed.

HANDSOME CATALOGUE FREE ON APPLICATION

The Good Roads Machinery Co.
KENNETT SQUARE, PA.



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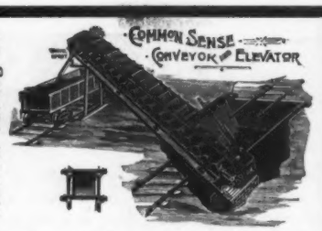

THE GENERAL CRUSHED STONE CO.,
So. Bethlehem, Pennsylvania,

have been using one of our **Common Sense Elevators** for six years—capacity 400 tons an hour.

THE C. O. BARTLETT & SNOW CO. CLEVELAND OHIO

FARREL ORE AND ROCK CRUSHER

USED IN ALL PARTS OF THE WORLD—LARGE RECEIVING CAPACITY—SPECIALLY DESIGNED AND CONSTRUCTED FOR HARDEST KIND OF WORK

COMPLETE CRUSHING PLANTS OUR SPECIALTY

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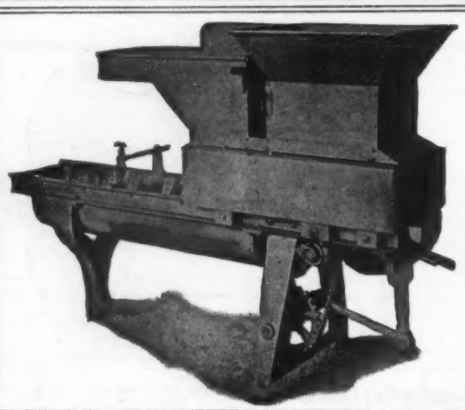
FARREL FOUNDRY & MACHINE CO. HAVEMEYER BUILDING, NEW YORK



"KENT" CONTINUOUS MIXER

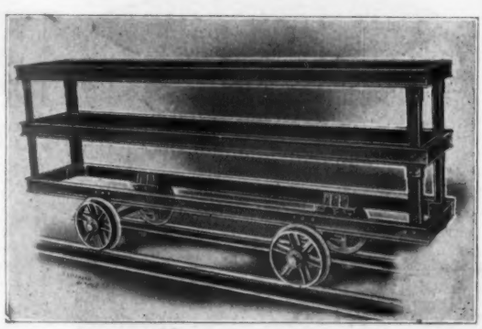
"The Mixer that measures and Mixes"

"You fill the Hopper, the Mixer does the rest"

Simple, reliable, economical, durable and moderate in price

Write for Catalogue and Prices to

The Kent Machine Co.
306 N. Water St., Kent, O.



The "KENT" Block Cars, Transfer Cars, etc.

Tell 'em you saw it in ROCK PRODUCTS

95-C IN SANDUSKY PORTLAND CEMENT COMPANY'S QUARRY

Bucyrus Shovels Are Loading Crushed Stone and Digging Blasted or Unblasted Cement Rock in the Leading Quarries in the United States.

THE BUCYRUS CO.

Branch Offices
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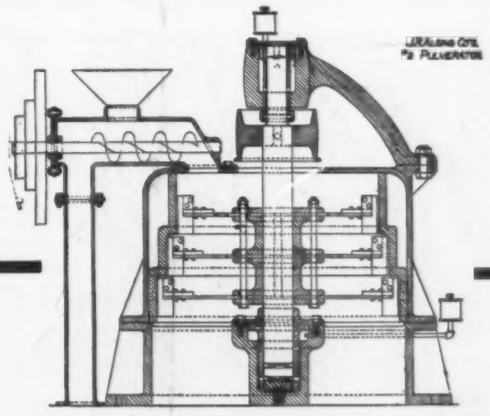
Main Office & Works:
South Milwaukee, Wis.



THE ALSING PULVERATOR No. 2

These machines are designed for very fine grinding and will reduce the material from a 2½ inch size to an impalpable powder. The grinding is done by the percussion principle instead of abrasion, etc., as in other makes. These Pulverators have demonstrated by actual use a great saving in cost of wear, tear, and maintenance. Simple in construction with fewer intricate parts to get out of order. They are so substantially constructed they will last a lifetime.

The J. R. Alsing Engineering Co.

INCORPORATED
90 WEST STREET, NEW YORK

"LITTLE GIANT" LOADING BLASTED ROCK.
Diamond Portland Cement Co., Middlebranch, O.

Giant Boom Shovels, six sizes, 1½ to 5 cubic yard dippers. **Little Giant Shovels,** two sizes, 1 ¼cubic yard dippers. **Revolving Shovels,** three sizes, ¾ to 1½ cubic yard dippers. **Steam** or **Electric Power. Traction Wheels** or **Railroad Trucks.**. Send today for booklets.

VULCAN

Steam and Electric Shovels

are the best that money can buy because they are **correctly designed and substantially built.** Every part is made of material which we know from our **thirty years' experience** in high class steam shovel building to be the **best for the purpose.** Before shipment each shovel is **set up complete** in our yards, **thoroughly tested under full steam** and all parts **carefully inspected** and **adjusted. You** are invited to witness this test and the shovel isn't shipped until **both of us are satisfied** that it is right in every respect. In addition to this, we give you the benefit of a **10 day trial test in your own quarry** and you don't have to accept the shovel until we have **demonstrated on your own work** that it is just as represented. Every shovel we build is covered with an **iron clad guarantee** to give complete satisfaction. Write us today, giving a description of your material and the amount you wish to handle per 10 hours and we will promptly send full information, specifications, prices, etc., of a shovel which we will guarantee to do your work satisfactorily.

THE VULCAN STEAM SHOVEL CO.

Toledo, Ohio

NEW YORK OFFICE: 45 Broadway; Telephone 4039 Rector
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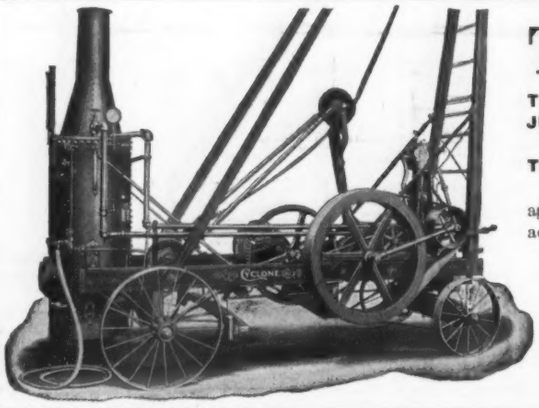


The Cyclone Wins Again

THE CONSTANT WINNING OF CONTESTS BY THE CYCLONE DRILLS DOESN'T JUST HAPPEN—there is a reason for it.

The **CONSTRUCTION, MATERIAL** and **PRINCIPLE** which enter into these drills are **THE REASONS.**

The test completed in the quarry of the U. S. Crushed Stone Company, at McCook, Illinois again demonstrates the superiority of the Cyclone drill from point of speed and maintenance; it adds another link in the chain of evidence that Cyclone drills are built right and run right.

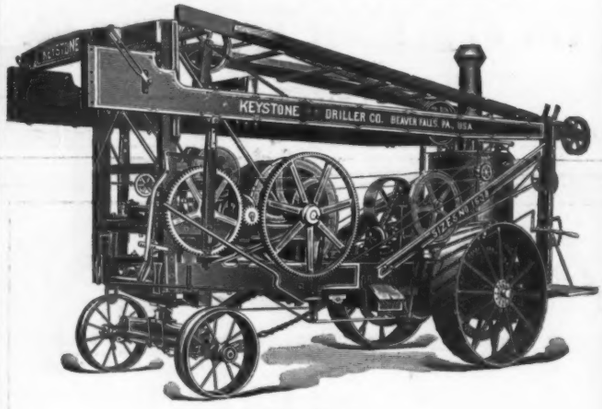
This is the reason why the U. S. and Canadian Governments, as well as the largest quarry people and railroad contractors, buy Cyclones.

WRITE US TO-DAY—DEPT. "20"

THE CYCLONE DRILL COMPANY, ORRVILLE, OHIO

CHICAGO OFFICE—419 Fisher Bldg. NEW YORK OFFICE—1456 Hudson Terminal Bldg.

For Big Blast Holes KEYSTONE CABLE DRILLS



Catalog No. 4

Keystone Traction Drill Co.

Monadnock Bldg., CHICAGO | BEAVER FALLS, PA., 170 Broadway, New York | CARTHAGE, MISSOURI

ROCK CRUSHERS

¶ The problem has always been to get jaws, concaves, heads, toggles, check plates that would wear!

¶ **Tisco Manganese Steel** has solved the difficulty and made rock crushing easy.

¶ Why stop so often for repairs when you can get **Tisco** parts that last many times longer than chilled iron parts.

¶ **Tisco Manganese Steel** will increase your output, reduce your repair account and increase the efficiency of your plant.

¶ Can you overlook these truths?

Bulletin 104-105.

Taylor Iron & Steel Co.

HIGH BRIDGE, NEW JERSEY

Deep Blast Hole Drilling

Is accomplished more economically than by any other method with the

"American" Drilling Machines

There is 40 years' experience behind these drills—they are standard.

Where electric power is available, equipped with motor they form the most portable and economical drill for quarry use.

Equipped with any power they are backed by the experience and reputation of the world's oldest and largest builders of this kind of drilling machinery.

Tell us your blast hole requirements. We have 59 regular styles and sizes of machines for your selection, made in types to meet every possible condition of work.

Write for our new catalog No. 105, the most complete "Drill-Hole" catalog ever issued.

THE AMERICAN WELL WORKS

General Office and Works: AURORA, ILL., U. S. A. Chicago Office: First National Bank Building

MAXECON

Means MAXimum of ECONomy

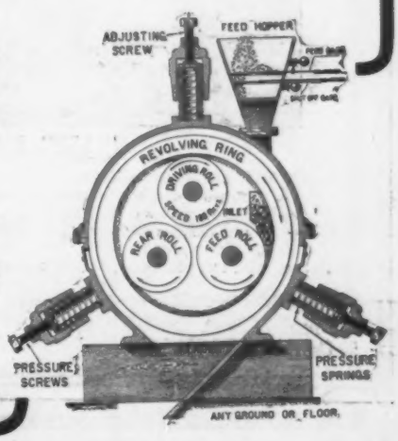
Years of experience with the assistance of our hundreds of customers has found THE SOLUTION OF GRINDING HARD MATERIALS. The MAXECON PULVERIZER combines highest EFFICIENCY, greatest DURABILITY and assured RELIABILITY. Uses the LEAST HORSE POWER per capacity. Embodies the features of our Kent Mill with improvements that make it MAXECON.

WE DO NOT CLAIM ALL of the CREDIT for this achievement

We have enjoyed the valuable suggestions of the engineers of the Universal Portland Cemen t Co. (U. S. Steel Corp.), Sandusky P. C. Co., Chicago Portland C. Co., Marquette Cement Mfg. Co., Western P. C. Co., W. H. Harding, Prest., Coplay P. C. Co., Cowham Engineering Co., Ironton P. C. Co., Alpena P. C. Co., Castalia P. C. Co., Pennsylvania P. C. Co., and many other patrons.

THE RING WOBBLES

The FREE WOBBLING POUNDING RING instantly and automatically ADAPTS its position to the variations of work.
Its GRINDING ACTION is DIFFERENT than any other; besides the STRAIGHT rolling action of the rolls, the SIDE to SIDE motion of the ring makes the material subject to TWO crushing forces and DOUBLE OUTPUT results.



KENT MILL CO. 170 BROADWAY, NEW YORK CITY
LONDON, W. C., 31 HIGH HOLBORN
CHARLOTTENBURG 5, WINDSCHEID STRASSE 40, BERLIN

OVER TWENTY-ONE CENTS A TON SAVING IN GRINDING COAL

By Using

THE RAYMOND ROLLER MILL

The following figures are not theoretical but were given us direct from the cost records of one of our customers who makes cement.

During and previous to 1906 they used Hammer and Tube Mills for grinding their coal. Beginning with 1907 they used Raymond Roller Mills. Here are their figures:

	1907 Raymond Mill	1906 Hammer and Tube Mill
Operation, cost per barrel	$.008	$.015
Repairs, cost per barrel	.004	.0175
Total	$.012	$.0325

Saving per barrel $.0205

For more than 200 customers, in different lines, grinding all kinds of material, we have given similar results. Can you **afford** to ignore that record? It will cost you nothing to talk to us. Ask us for further information.

Raymond Brothers Impact Pulverizer Company

517 Laflin Street, CHICAGO

SAND AND GRAVEL PLANTS

THIS IS THE PLANT

THE photographs show a plant entirely equipped with "S-A" Belt Conveyors, Transmission Machinery, and our patented "Gilbert" Screens. We have furnished more plants of this kind than any one else in the country and are prepared to submit designs and prices on complete outfits for plants of any capacity from 100 to 5000 yards per day. We have made a special study of this class of machinery, and our plants are **money makers for the owners.**

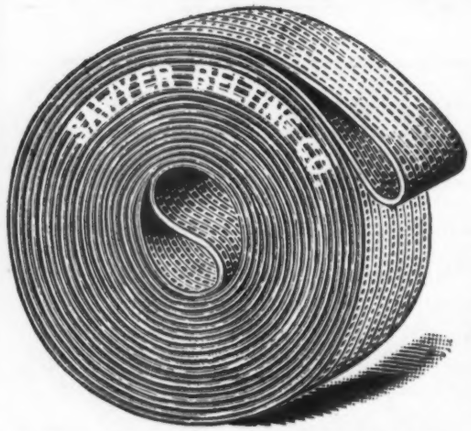
THIS IS THE PRODUCT

THERE are splendid profits in the business of selling sand and gravel. The main features being to furnish a high grade product and to furnish it at the minimum cost per yard. This can be accomplished by our process.

BRANCH OFFICES:
164 Dearborn Street, CHICAGO
50 Church St., NEW YORK CITY

STEPHENS-ADAMSON MFG. CO.
Aurora, Illinois

THE ONLY WAY



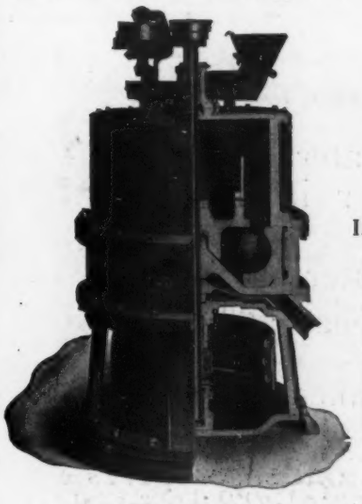
TO APPRECIATE THE
ECONOMICAL VALUE
OF **SAWYER STITCHED CANVAS BELTING** IS TO
GIVE IT A TRIAL. IT'S BEEN MAKING GOOD FOR TWENTY YEARS.

FOR FLAT, TROUGH, OR BUCKET ELEVATING, MAIN DRIVING, IT HAS PROVEN ITSELF TIME AND TIME AGAIN

A GENUINE MONEY SAVER

ADDRESS ENG. DEPT. **SAWYER BELTING CO.** CLEVELAND, O.

The Fuller-Lehigh Pulverizer Mill



Cement Companies equipped with Fuller Mills advertise the fact that the consumer gets 38 pounds more of the IMPALPABLE POWDER or REAL CEMENT in every barrel of cement produced by The Fuller Mill than by any other

Produces Commercially

Cement having a higher percentage of Impalpable Powder than can be obtained by any other mill. Tests show that the tensile strength of a 1-5 mortar made with cement pulverized by the Fuller Mill is higher than the tensile strength of a 1-3 mortar made with cement pulverized to the fineness required by the Standard Specifications.

Lehigh Car, Wheel & Axle Works

Main Office CATASAUQUA, PA.

New York, N. Y. Denver, Colorado

Hamburg, Germany, Alsterdamm 7

ANOTHER SURPRISE!

Last month we told you "THE GANDY BELT" was one-third the cost of leather belting.

This was a distinct surprise to many.

No doubt it was hard to realize that "THE GANDY BELT" was equally as good or better than leather and yet only one-third its cost until we emphasized the fact that it had been on the market for thirty-four years used under varying conditions in all lines of industry and every foot sold under a strict guarantee.

We now tell you that it is 25% cheaper than rubber.

For elevating, driving and conveying purposes it is the most durable and economical belt on the market. Will you let us prove this? We will gladly send you letters from actual Gandy Belt users in your own line of work.

To acquire "THE GANDY BELT" habit means the saving of money by you. Send us your name and address for booklet "Experiences with Gandy."

The Gandy Belting Company

744 West Pratt Street

Baltimore, Md.

New York Office: 88-90 Reade St.

For Bargains See our Classified Section Page 53

Rubber Belting Troubles Overcome

Every difficulty heretofore met with in the use of rubber belting entirely eliminated in

"R. F. & C." (Rubber Filled and Covered) Solid woven rubber belting.

Ask us for sample and further information.

W. H. SALISBURY & CO., Inc.

Est. 1855 166-168 Wabash Ave., Chicago, Ill.

Leviathan Belting

MAIN BELTING COMPANY, Market and Randolph Sts. CHICAGO, ILLINOIS

Philadelphia New York Boston Buffalo Pittsburg

"NESTOR" Unsurpassed as an Economical Belt Conveyor

FOR COAL, SAND, CRUSHED STONE, CLAY, BRICK, SLAG, ETC. WRITE FOR SAMPLE AND PRICES. :: ::

THE AMERICAN FABRIC BELTING COMPANY

CLEVELAND, OHIO

Every Steam Plant

Would Be Better If Equipped With REILLY SPECIALTIES

The Reilly Feed Water Heater has coiled tubes, removable through a door in the shell, without disturbing pipes.

The Goubert Feed Water Heater is probably the best known and best liked **straight-tube** heater on the market.

The Stratton Steam Separator takes **all the water** from the steam.

The Thompson Evaporative Condenser gives more power to the plant, without increasing the water consumption.

WRITE FOR CATALOGUE OF WHATEVER INTERESTS YOU

THE GRISCOM-SPENCER CO., 90 West St., NEW YORK

Williams Raw Material Grinders

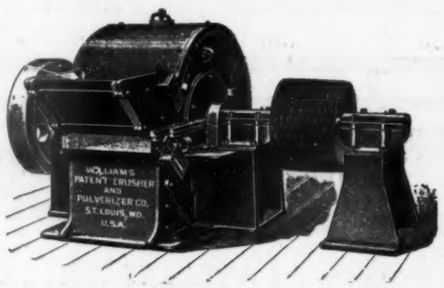
The "New Williams" Universal, our fine grinder, is used for preliminary work ahead of the Tube Mill, capacity No. 3 size, 800 bbls. in 22 hours, 95 per cent. through 20 mesh, with 40 to 50 horse power.

Also used extensively for fine grinding on Gypsum, Lime, Coal and Shale.

The "Vulcanite" Mill, our coarse grinder, prepares raw material ahead of Roller Mills. The No. 3 size has a capacity of 20 tons per hour, fineness, ½-inch, ¼-inch and ¼-inch, horse power 40 to 45.

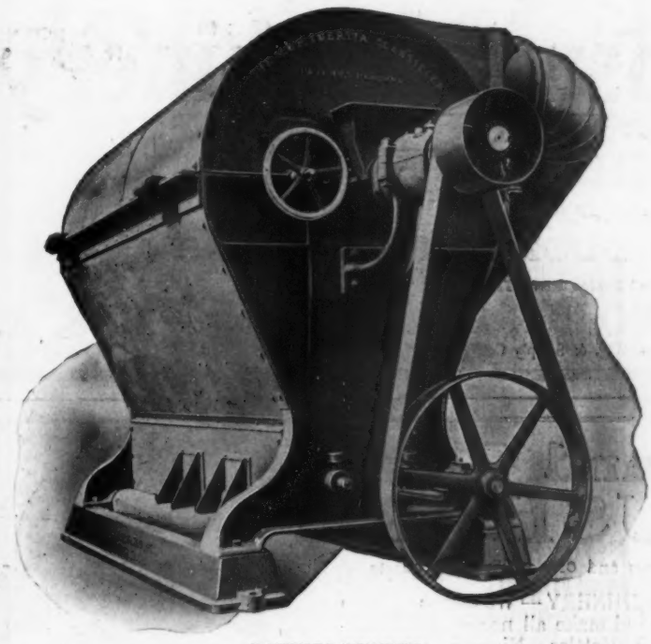
Over 1550 machines in daily operation.

Bulletin No. 12 gives further details.



The Williams Patent Crusher & Pulverizer Co.

Works: 2701 North Broadway, St. Louis, Mo.
Sales Office: Old Colony Building, Chicago
San Francisco Offices: 428 Monadnock Building



PATENTS PENDING

FEW FACTS

ABOUT

The Morscher-Ehrsam Inertia Classifier

Adjustable for making separations rom 80 mesh to 200 mesh.
Intake capacity from 5 to 10 tons per hour
Separations as positive as can be made on screens, with no perceptible variations in product owing to the variations of the speed or load.
Requires no more space than a Reel or Screen and the capacity is 20 times as great.
Material can be spouted direct from elevator head into machine.
No dust collectors or air spouts required.
We recommend its use in connection with gradual reduction on all classes of material where fine product is required. *Write for more information.*

Manufacturers of Jaw and Rotary Crushers for Gypsum, Vibrating Screens, Hair Pickers, Wood Fibre Machines, Calcining Kettles, Plaster Mixers, Power Transmission

The Enterprise Vertical Burr Mill

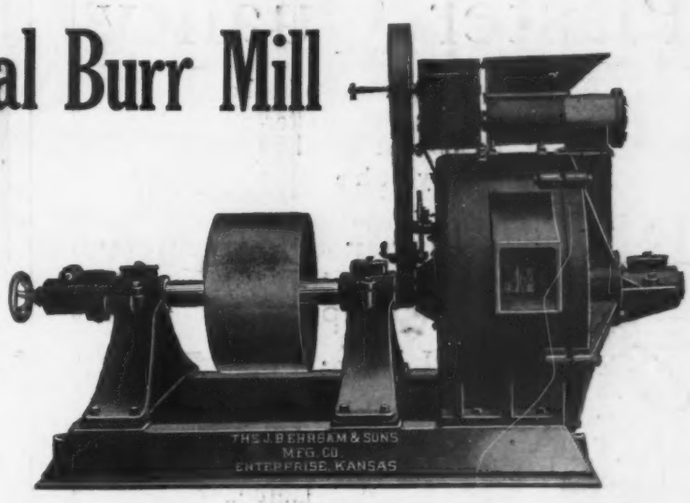
is especially designed for grinding gypsum, limestone, coal, coke, paint, rock, foundry facing, carbon, salt, and other similar substances.

It is STRONG and DURABLY built.

Has INTERCHANGEABLE STONES, which can be easily removed for dressing and replaced.

Is provided with our POSITIVE CONTROLLABLE FEEDER, which feeds an absolutely uniform stream into the mill at the required capacity.

MANY OTHER ADVANTAGES.



The J. B. Ehrsam & Sons Mfg. Co.

Designers and Builders of

Complete Equipment for Plaster Mills

ENTERPRISE, KANSAS, U. S. A.

GET THE BEST

Finest Line of Gypsum Machinery

MADE

KETTLE CRUSHER NIPPERS

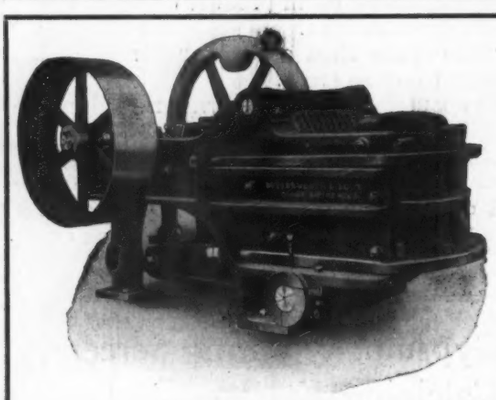
ASK FOR CATALOG OF

MOGUL NIPPERS. OPEN DOOR POT CRUSHERS

Best Mills in the United [illegible]dom

McDONNELL BOILER & IRON WORKS, Des Moines, Iowa, U. S. A.

"Formerly Des Moines Mfg. & Supply Co."



Nippers—made in 3 sizes.

Jaw and Rotary CRUSHERS

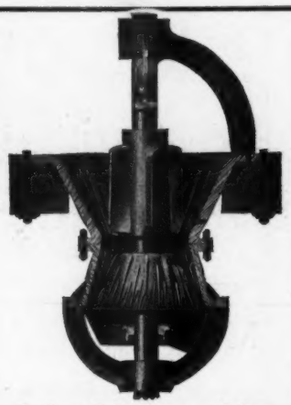
For all Rocks and Ores Softer than Quartz

GYPSUM MACHINERY — We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting, etc.

Special Crusher-Grinders for Lime

Butterworth & Lowe

17 Huron Street, Grand Rapids, Mich.



Crackers—5 sizes—many variations.

Plaster Quality

The highest perfection in the production of plaster has been reached by the

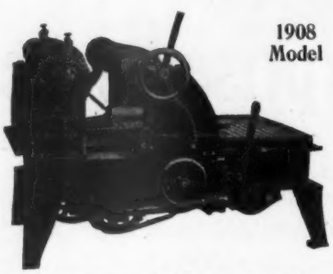
Dakota Plaster Company

Why? Listen:

The Dakota Plaster Company's deposits are 98 per cent Pure Gypsum. Its plant, built in 1910, was erected without regard to cost, and is one of the best equipped and latest improved plaster mills in the world.

The Dakota Plaster Company
Black Hawk and Rapid City, S. D.

The Shuart-Fuller Improved Fiber Machine



1908 Model

Has an automatic, proportional, increasing feed, which keeps grade of fibe uniform from start to finish, and holds machine to highest possible rate of production for the grade of fiber and number of saws. Does not begin with fiber and end with dust, nor fall off in rate of production on each log, from 40 to 80 per cent as do the ordinary non-increasing feed machines. Works logs up to 24x24 inches. No royalty string attached to sale. Pay no attention to misrepresentations of our competitors, but write for descriptive circular and terms to

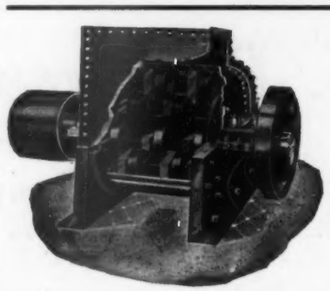
The Shuart-Fuller Mfg. Co.
ELYRIA, OHIO

THE SHUART-FULLER CO., Elyria, Ohio. St. Louis, June 17, 1907.

Gentlemen:—We are just in receipt of advice from our New Mexico plant wherein they state that the Wood Fiber Machine recently shipped by you is doing all that we have asked of it and running very fine.

ACME CEMENT PLASTER CO.,
By Jas. R. Dougan, Sec.

The Pulverizer



That is Guaranteed to do Your Work

Write for Particulars

American Pulverizer Co.
410 Jaccard Bldg.
St. Louis, Mo.

Stucco Retarder

Strong
Uniform
Fine Ground
RETARDER

We are the oldest Retarder firm in the United States, and above is our motto. New fire-proof plant and prompt service.

FREE SAMPLE ON REQUEST

Chemical Stucco Retarder Co.
WEBSTER CITY, IOWA.
INCORPORATED 1895

CUMMER CONTINUOUS PROCESS
FOR
CALCINING GYPSUM
NO KETTLES USED
PLANTS IN OPERATION
Great Saving in Cost of Manufacture and Quality of Product Guaranteed.
The F. D. CUMMER & SON CO., Cleveland, O.

PLYMOUTH CEMENT
AND
WOOD FIBER PLASTER
The Brand that's Made from Pure Gypsum Rock
WRITE US FOR PRICES AND ADVERTISING MATTER
Plymouth Gypsum Co.
Fort Dodge, Iowa

RETARDER Wood Fiber

THE OHIO and BINNS RETARDER CO.
PORT CLINTON, OHIO

Reliable Stucco Retarder=Strong=Uniform in Strength=
Duplicate power plant (electric and steam power) installed so as to preclude any possibility of shut down and consequent shut down of mixers who depend upon us for their supply of Retarder. We have a capacity large enough to supply every retarder user in the U. S. and Canada, and some to spare for Europe. Our mills are fireproof in every particular. Write us for prices and information.

THE OHIO and BINNS RETARDER CO.
PORT CLINTON, OHIO

"NIAGARA"
IS THE BRAND

We cannot dwell too strongly upon the increased bulk and consequent greater covering capacities of our "NIAGARA" line of wall plasters, their favorable working qualities under the mechanics' tools and final strength.

Niagara Neat Cement
Niagara Sanded Mortar
Niagara Wood Fibre (Wood Pulp)

Dealers realize the additional dollars in the handling of our products because of their preference by the trade and good sense is displayed in pushing their sale. MIXED CAR LOAD SHIPMENTS of wall plasters, hydrated finishing lime, plaster board, land plaster, and calcined plaster for finishing purposes.

ALL BUSINESS DIRECT WITH SALES OFFICE.

Dollar Sense

NIAGARA GYPSUM CO.
BUFFALO, N.Y.

KING'S WINDSOR CEMENT
FOR PLASTERING WALLS AND CEILINGS

Buffalo Branch, CHAS. C. CALKINS, Manager
322 W. Genessee Street.

Not the hardest, but the toughest and best Wall Plaster made—Can be applied with less labor. Has greater covering capacity than any other similar material

J. B. KING & CO., 17 State Street, New York.

Robert W. Hunt Jno. J. Cone Jas. C. Hallstead D. W. McNaugher

ROBERT W. HUNT & CO., Engineers
Bureau of Inspection, Tests and Consultation

New York—90 West St. Chicago—1121 The Rookery. Pittsburg—Monongahela Bank Bldg
London, E. C., Eng.—31 Norfolk House. San Francisco—425 Washington St.
Montreal—Can. Exp. Bldg. St. Louis—Syndicate Trust Bldg. Mexico City, Mex.—20 San Francisco St.

Tests and Inspection of Cement—Reinforcing Steel and all Cement Materials and Products—Supervision of Construction and Tests of Concrete Structures—Reports on Cement Properties and Existing Concrete Structures—Design of Cement Plants and Inspection of Cement Machinery—Chemical and Physical Testing Laboratories
"All Manner of Tests on all Classes of Material"

THE FULLER ENGINEERING CO.
DESIGNING, CONSTRUCTING AND OPERATING ENGINEERS ANALYTICAL CHEMISTS
CEMENT MILLS A SPECIALTY
OFFICES: ALLENTOWN NAT. BANK BLDG. ALLENTOWN, PA.

Dealers or Contractors: Write for Samples, Prices and Particulars. You will be Interested

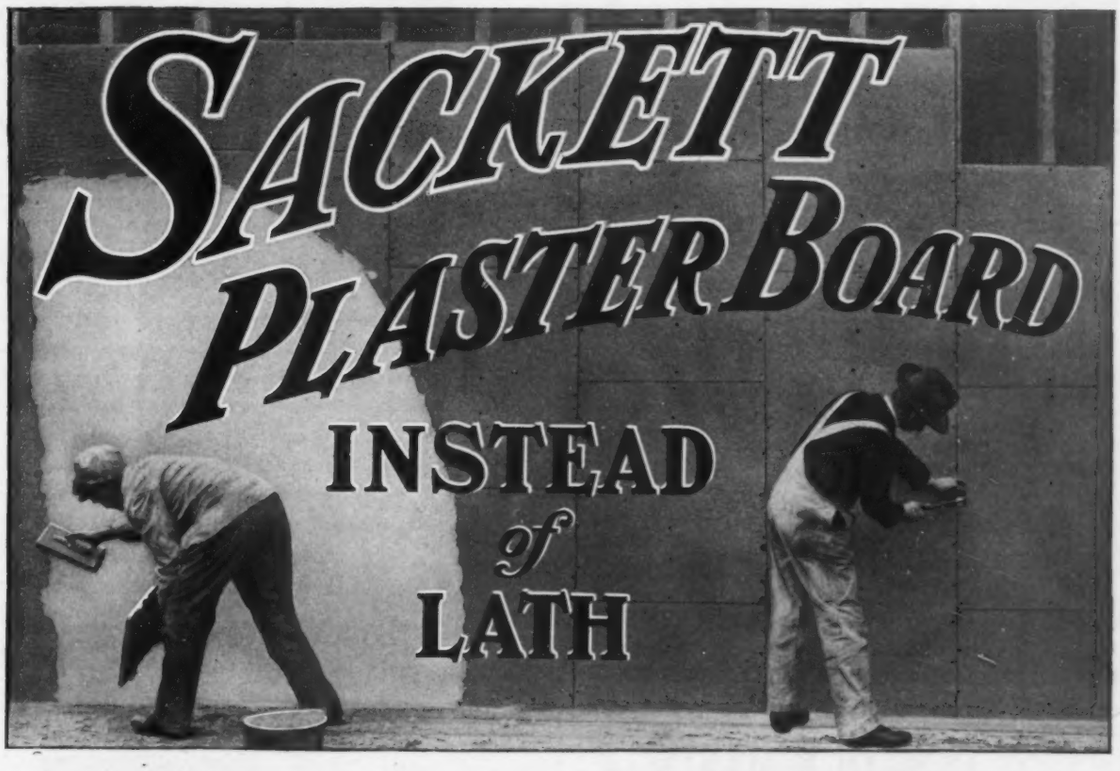
We Carry a Full Assortment of Sizes of

Beaver Board

The Most Beautiful, Durable and Economical Covering for all Kinds of Walls and Ceilings. Takes the Place of Lath and Plastering.

WISCONSIN LIME & CEMENT CO.
Selling Agents and Distributors
607 Chamber of Commerce
Chicago, Ill.

Good Judgment Demands



THE VOICE OF EXPERIENCE

There's nothing new fangled about SACKETT Plaster Board. It has stood the test of time, demonstrating its superiority over other methods of lathing—received and approved by the entire building world.

SACKETT PLASTER BOARD

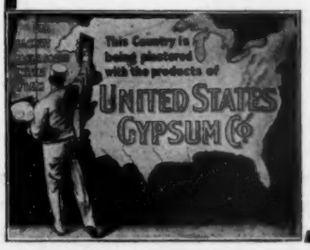
Fireproof Soundproof Verminproof

is a staple, quick selling commodity in every up-to-date dealer's line. The reason for its rapidly growing demand is self evident—natural demand of architects and builders generally for

BETTER! SAFER! MORE SANITARY WALLS!

If you don't know SACKETT Plaster Board and its many advantages, do yourself the justice to get the facts immediately—facts of **vital interest**—and **profit to you.**

We can help you help yourself—Send for the facts at once.



United States Gypsum Company

New York Cleveland Chicago Minneapolis Kansas City San Francisco

The Improved Peerless
One Man Cement Brick Machine

Equipped with new tamping device, which tamps ten bricks in the machine at one operation, making 12,000 perfectly formed bricks in ten hours.

The superiority of the Peerless Brick Machine was demonstrated conclusively at all of the recent conventions.

It is the greatest invention in the industry. Simple, strong and durable. Combines all the advantages of every other machine at the smallest cost.

The most successful and most easily operated one-man brick machine ever made.

Write at once for particulars.

Peerless Brick Machine Co.
15 North Sixth St., - MINNEAPOLIS, MINN.

PERFECTION IN BLOCK MAKING

If you wish to attain this you should combine these three important features:

Wet Process, Face Down, Damp Curing.

The **PETTYJOHN INVINCIBLE** Machine does this, and is the only machine that does. Tandem Invincible makes two blocks at once. Price $65.00 and up. Single Invincible, $35.00 and up. With our **Triple Tier Racking System** green blocks can be stacked three high direct from machine with inexpensive home-made rigging. Plans and blue prints free to customers. It economizes space, reduces off-bearing distance and above all insures slow, even, damp and perfect curing and bleaching.

Write for our latest edition of **"Stone Making,"** a book of valuable data, just off the press—**FREE**

THE PETTYJOHN COMPANY
614 North Sixth Street Terre Haute, Indiana

Red, Brown, Buff and Black

CHATTANOOGA PAINT CO. MORTAR ECLIPSE COLORS CHATTANOOGA, TENN.

MORTAR COLORS

The Strongest and Most Economical in the Market.

CHATTANOOGA PAINT CO. STANDARD LOWE'S PAINT CHATTANOOGA, TENN.

Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

CHATTANOOGA PAINT CO.
Chattanooga, Tennessee

SPECIAL NOTICE—ALL ORDERS ARE ACCEPTED SUBJECT TO DELAYS OCCASIONED BY CAUSES BEYOND OUR CONTROL AND WITH THE UNDERSTANDING THAT NO CLAIMS FOR DAMAGES OR LABOR WILL BE ALLOWED. OUR LIABILITY CEASES WHEN GOODS ARE DELIVERED TO CARRIERS. ADDRESS ALL LETTERS TO THE COMPANY.

L. B. RAYMOND, Pres. and Treas. C. M. LAURITSEN, V.-Pres. and Mgr. F. C. SPRING, Secy

THE

RAYMOND BROS. IMPACT PULVERIZER CO.

ROLLER MILLS, AUTOMATIC PULVERIZERS
VACUUM AND SCREEN SEPARATORS
SPECIAL EXHAUST FANS

TELEPHONE MONROE 1295
CABLE ADDRESS: "IMPACT"

OFFICE AND WORKS:
820 LAFLIN STREET
1200 W. HARRISON STREET

EUROPEAN AGENTS:
INCHEMBURG BUREAU
RYLINDRECHT
PRINS MAURITSPLEIN 14
THE HAGUE, HOLLAND

CHICAGO, May 6, 1910.

Rock Products,
355 Dearborn St.,
Chicago.

Gentlemen:

In reply to your inquiry of May 3rd, we have carefully checked up our records and are pleased to advise that the inquiries we have received as a result of our Ad. in your paper cost us less than from any other high class medium in which we advertise and we have been able to trace some profitable business closed through our advertisement.

Trusting this covers the ground to your satisfaction, we remain,

Yours very truly,
RAYMOND BROS. IMPACT PULVERIZER CO.
C. M. Lauritsen
V.P. & Mgr.

All agreements are contingent upon strikes, accidents, or other delays beyond our control

CABLE ADDRESS "HERCULES" ROCHESTER NY
WESTERN UNION CODE
299-309 ST PAUL STREET Rochester, N.Y. 5/21/10

Mr. Bernard L. McNulty,
Francis Publishing Co.,
Chicago, Ill.

Dear Sir:-

In answer to your favor of the 3rd, would state that we have been almost continuous advertisers in Rock Products since the year of 1905 and while not the largest advertisers, we have always felt that the publication paid us handsome returns on the amount expended and we can truly state that the courtesies extended us by the members of your company in the way of write-ups and general help are highly appreciated.

Very truly yours,
CENTURY CEMENT MACHINE CO.
A. T. Radley

ATE/M

Concrete Blocks

Highest Attainment of the Concrete Industry

MADE BY CENTRIFUGAL FORCE

Strictly a High Class Factory Proposition

Speedy and Economical. The machine does all the work except the original mixing and piling up the finished product.

No Tamping. The mixture is poured into the moulds, then revolved rapidly, producing a pressure of thousands of pounds, **uniformly,** on every part of the block. The excess water is then extracted as a fine mist, and in about sixty seconds the blocks are ready to be removed from the moulds.

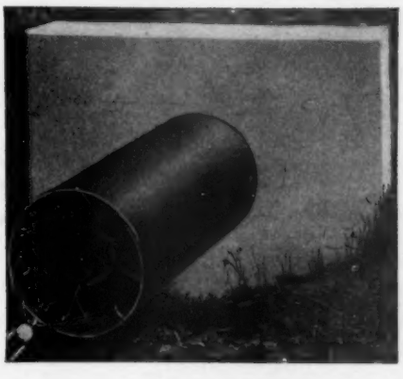
The Way it is Done. Take a West Slush Mixture of Portland Cement with any suitable aggregate and after a thorough mixing pour into the moulds successively until all are filled. Then throw the belt upon the service pulley for one minute or less at a high speed with the development of tremendous pressure in the fully perfected Centrifugal Machine. Remove the finished blocks from the molds and leave them on the pallets for a few hours. The blocks are then ready for storage in the yard or can be used in the wall within 12 hours. Fully protected by patents. Standard size machines in operation more than 2 years.

Centrifugal Concrete Machine Company

805 Corn Exchange Bank Bldg.
CHICAGO, ILL.

This machine makes 600 blocks in a 10-hour day, 8"x8"x16"

Concrete Culverts Sewers and Conduits



Made with Miracle Collapsible Steel Forms are Everlasting

Forms built in four standard sizes—Diameters 12 in., 24 in., 36 in., 48 in.—Length 6 ft. to 10 ft.

SPECIAL SIZES BUILT TO ORDER

Concrete cheaper than plank, clay pipe or corrugated iron

COMPARATIVE COST OF FOUR KINDS OF 16-FOOT CULVERTS 24-INCHES IN DIAMETER

The prices of the MIRACLE Culvert Forms are reasonable. They pay for themselves in a single season.

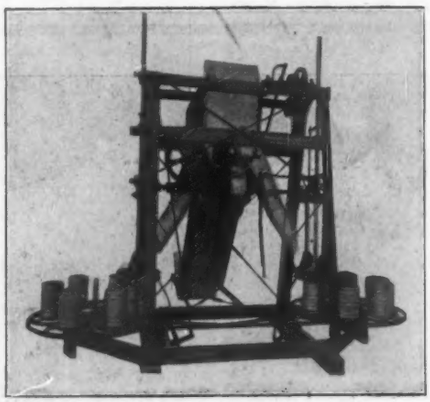
CONCRETE		PLANK		CLAY PIPE		CORRUGATED IRON PIPE	
72 cu. ft. require 12 bags of Cement (3 barrels), at $2.00	$6.00	242 ft. in Lumber, at $35 per 1000, cost	$8.00	16 ft. Vitrified Clay Pipe, 24 in. in diameter, at $1.35 per foot	$21.60	16 ft. Corrugated Iron Pipe, at $1.58 per ft.	$25.28
32 sq. ft. 3-in. Mesh, No 16 Gage Expanded Metal, at 4c.	1.28						
	$7.28		$8.00		$21.60		$25.28

EVERYTHING IN CONCRETE MACHINERY—MARSH MIRACLE LINE

MARSH CO., 971 Old Colony Building, CHICAGO

THE

McCracken Double Tile Machine



The McCracken Double Tile Machine makes all sizes of cement tile from 4 to 16 in. in diameter at the rate of from 10 to 20 tile per minute. Also makes building blocks or construction tile 8x8x16 at the rate of 2000 to 3000 per ten hour day.

The machine will make two different sizes of tile at the same time or building blocks and tile at the same time, or either end of machine can be used without using the other.

The machine has no cams and runs just as smooth at high speed as when running slow. Takes less labor per 1000 tile than any other machine.

Tile are packed so hard that the large sizes can be carried without the use of pallets. Machine is very simple and strong and runs very light, and elevator can be started and stopped without stopping the machine.

See the McCracken Machine before you buy. Write to

The Sioux City Cement Machinery Company
219 4th Street, SIOUX CITY, IOWA

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BOTTOM AND SIDE DUMP CARS, TRANSFER CARS, TURNTABLES, SWITCHES, ETC.

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¶ The Schenk Machine has a capacity of from 3,000 to 5,000 cement drain tile in ten hours; it requires the aid of six men, a mixer and power to operate. The Schenk is sold on an iron-clad guarantee and is backed by the basic patents and the oldest and strongest company in the business.

¶ Our free catalog will give you information relative to the equipment necessary, the construction of buildings, the amount of capital required, and the amount of profit to be expected; in fact it tells you how to start a cement drain tile plant and what you will be able to realize on the investment.

The Cement Tile Machinery Co. Rath Street Waterloo, Iowa

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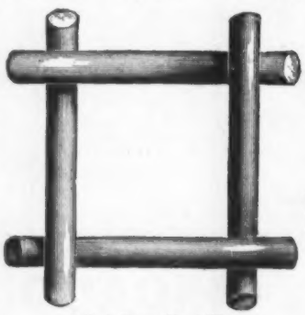

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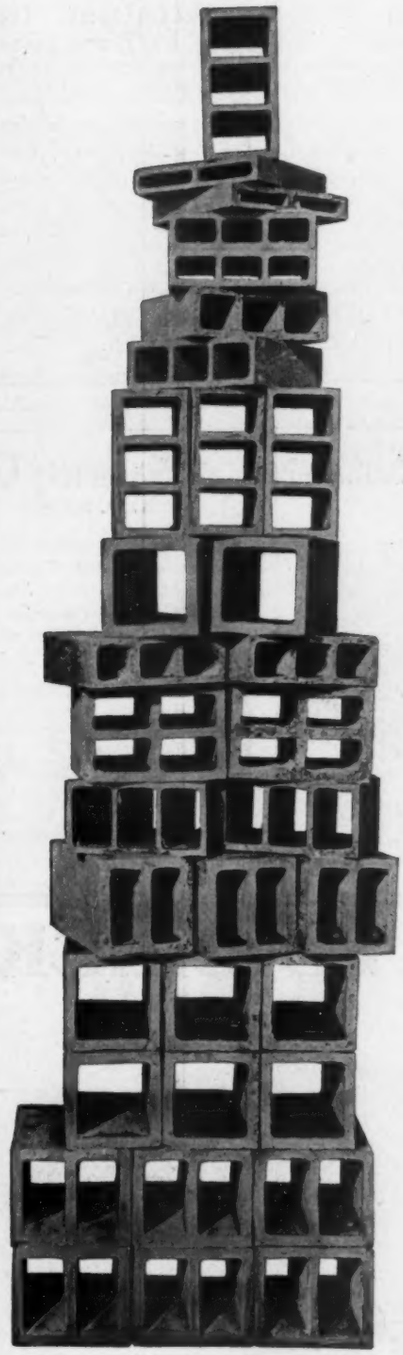

Has The First *Pauly* Concrete Tile Plant Been Successful?

This question, which is usually first asked us by interested parties, is best answered by two facts:—1. During the year of 1909, the demand in Youngstown, Ohio, could not be satisfied, and (2) the plants capacity output is sold until the middle of the summer of 1910, **in the City of Youngstown alone.** In this connection it might be stated also that 4 tiles of our most common size, 8x8x16, can be manufactured from one cubic foot of concrete, with a labor cost of 50 per cent of the cost of concrete anywhere east of the Mississppi.

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Our 1910 Catalog

Gives the method of manufacture, fire and compression test data, and the endorsements of local architects and other building authorities. Also many other articles and illustrations of interest to the general public. May we send you, postpaid, a copy of our Catalog?

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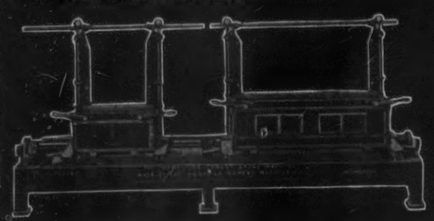
THE ONLY machine on which four 16 inch stone can be made at ONE time, or two 20 inch, 24 inch or 32 inch stone at one time.



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are the BEST for you—Because they go Further—Do more and Do it Better than other machines.

They are unlimited as to production. You can start with a small equipment and add to it gradually according to the demand.

And not be compelled to be continually buying new machines.

If you are going to manufacture Concrete Blocks write for our Catalogue.

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The Perfection Power Block Machine is the only Power Block Machine on the market, making a Hollow Concrete Building Block under Heavy Pressure and at Great Speed.

Machines have been in constant use since July 1st, 1905, with practically no expense for repairs.

The machine handles sand, gravel, crushed rock, slag and coloring materials perfectly.

All materials accurately measured, thoroughly mixed and uniformly pressed under 200,000 pounds pressure.

Makes 8, 9 and 12x8x24 inch blocks in five faces, and fractional and angle blocks.

Machine can be arranged to make **Two Piece** and **Faced** Blocks, if desired.

All machines delivered set up and put in operation to show a guaranteed capacity of 60 blocks (12x8x24 inch) per hour with five men.

Blocks perfectly cured in 24 hours in Vapor Curing Kilns of our own design.

Full details, catalog, testimonials, etc., sent upon request.

THE PERFECTION BLOCK MACHINE CO.
SIOUX FALLS, SOUTH DAKOTA.

The American Sandstone Brick Machinery Co.

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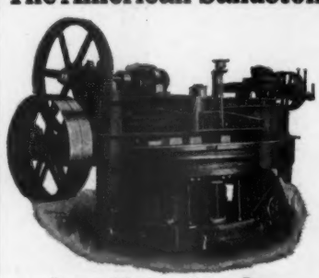

Improved Saginaw Rotary Press.

Built either right or left handed in three sizes of capacities of 800, 1400 and 2200 brick per hour. Can be equipped with extra table for making face and fancy brick on which double pressure is exerted.

Complete Sandstone Brick Plants or Partial Equipments Installed Under Absolute Guarantees as to Capacity, Quality, and Cost of Production.

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SAND LIME OR SILICATE BRICK

This plant located at South River, N. J., was formerly intended to operate under the "Division System" but is now being reconstructed to conform in every detail to the Wiebe-Hydro-Lime-Silicate-Process, and will be when completed the largest plant in the United States with a daily capacity of 100,000 brick.

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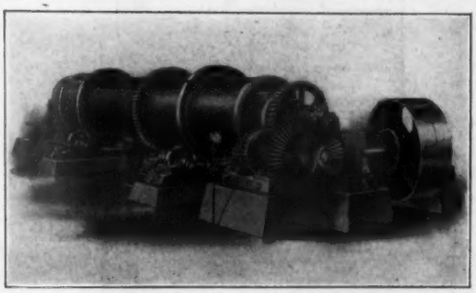

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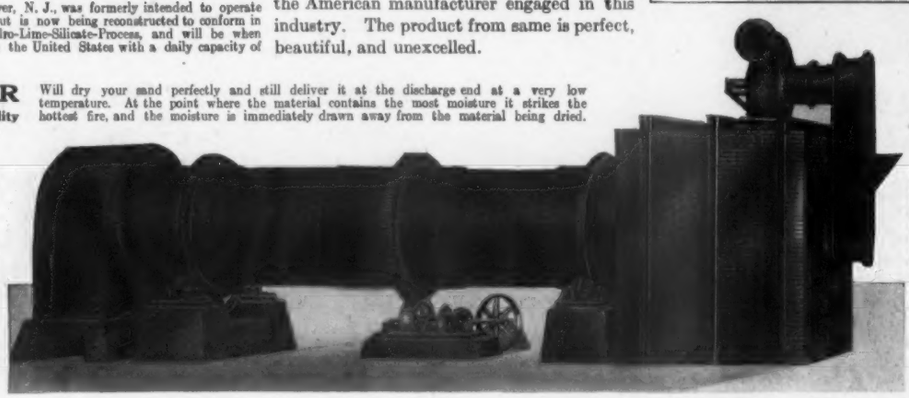

Hydro-Vapor Preparation Machine

Eliminates your doubts and worries. No sand-lime-brick plant is complete or successful without this machine. Receiving the material from the Silo, it prepares and delivers same in an absolutely perfect condition for the press.

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Dating as far back as 1901, when the manufacturing of commercial silicate brick was introduced into this country, no system has been more successful than the so called "Silo" or "Division" method.

In the ratio that the Silo or Division Process is superior to all other systems hitherto employed, in that proportion the Wiebe-Hydro-Lime-Silicate process is superior to the Division methods.

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Do you wish to know WHY our process is superior to all others? If you have any experience in the production of silicate brick, and will allow us to show you the merits of our process, you can easily understand why, and you will then readily appreciate the merits thereof. If you are interested we will gladly enter into any detail necessary to demonstrate the superiority of our system over all others.

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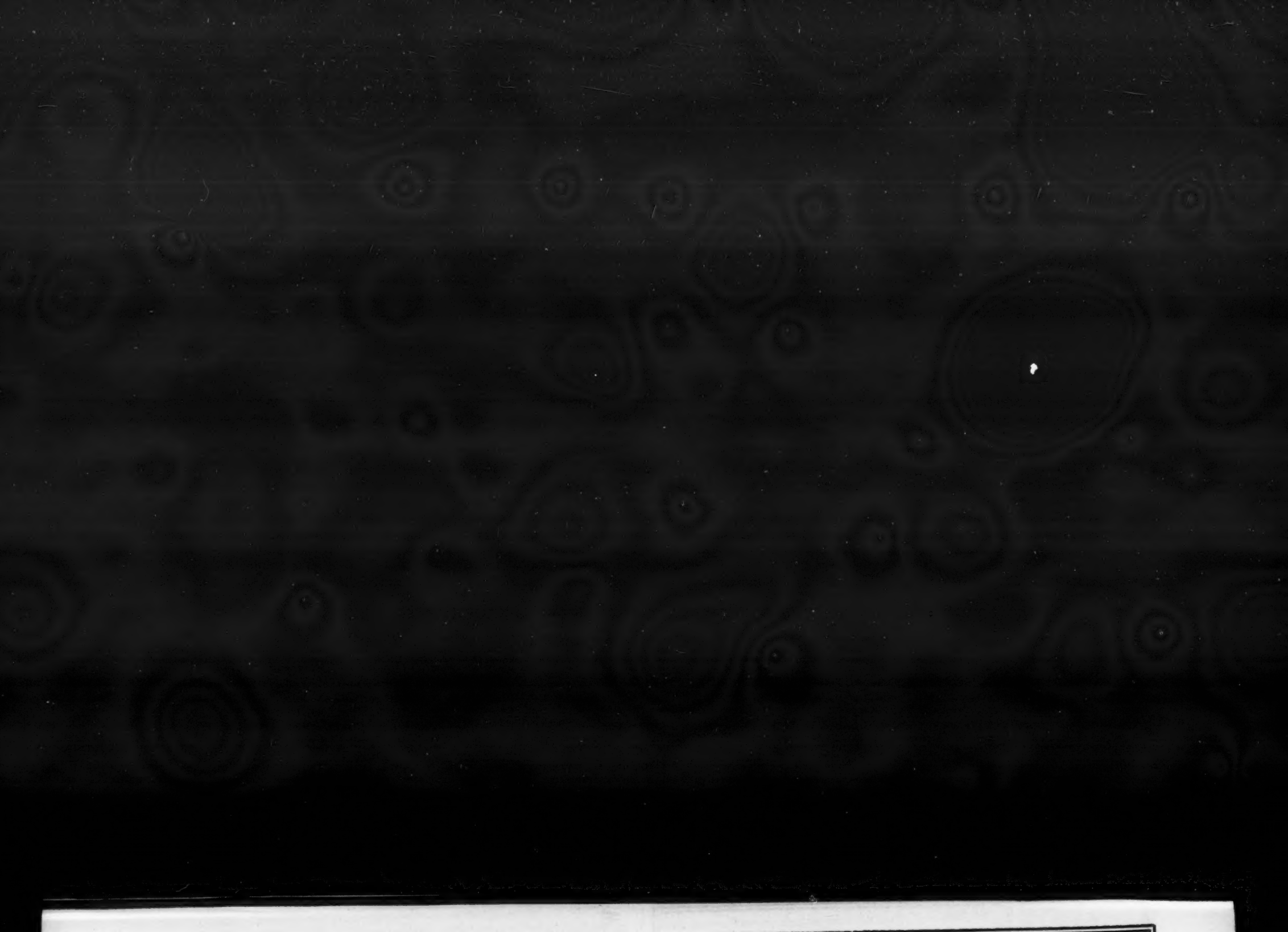

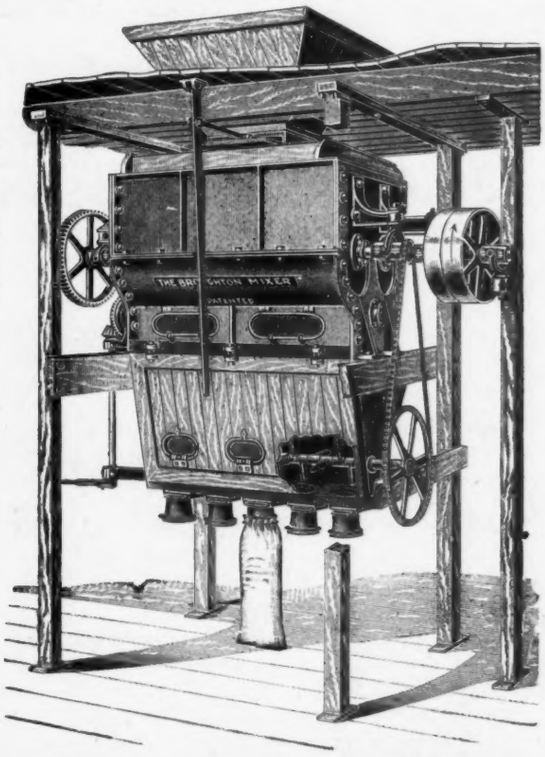

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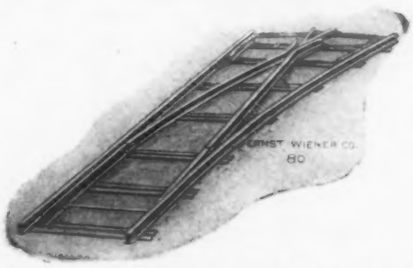

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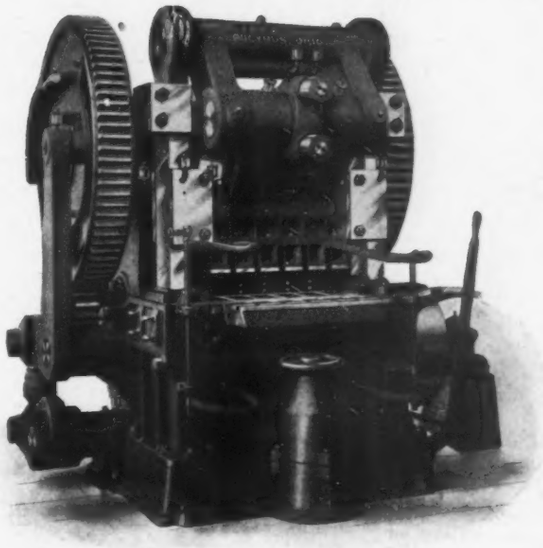

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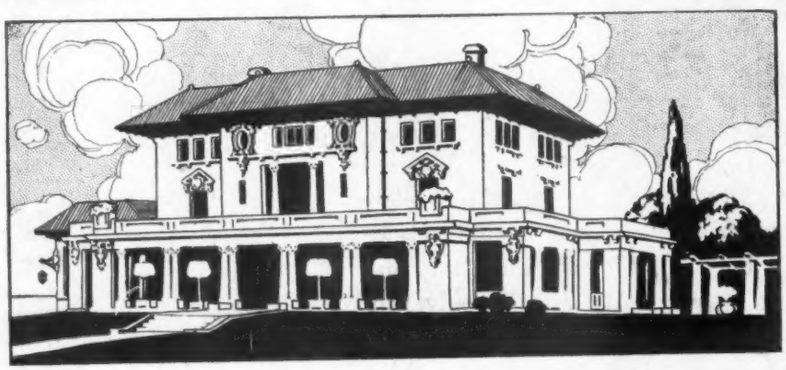

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